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Ontario. Legislative Assembly

SESSIONAL PAPERS.

VOL. XXV.—PART VII.

THIRD SESSION OF SEVENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

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SESSION 1893.

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1893.

LIST OF SESSIONAL PAPERS.

ARRANGED ALPHABETICALLY.

TITLE.	No.	REMARKS.
Accounts (*Dominion and the Provinces*)	65	*Printed.*
Accounts, Public	14	"
Agricultural and Arts, Report	11	"
Agricultural College, Report	22	"
Agricultural Societies, Analysis	60	*Not printed.*
Anatomy, Inspector, Bodies received by	71	*Printed.*
Asylums, Report	8	"
Baxter, Judge, commutation	33	*Not printed.*
Bee-Keepers' Association, Report	83	*Printed.*
Births, Marriages and Deaths, Report	5	"
Blind Institute, Report	6	"
Bonds and Securities	53	*Not printed.*
Canadian Institute, Report	23	*Printed.*
Cattle, Dehorning, Report	2	"
Central Farmers' Institute, Report	84	"
Cholera regulations	66	"
Colonization Roads and Bridges	78	"
Crown Lands Report	17	"
Dairymen's and Creameries', Report	16	*Printed.*
Deaf and Dumb Institute, Report	7	"
Dehorning Cattle, Report	2	"
Division Courts, Report	26	"
Drainage Commission, Report	32	"
Duffern License Commissioners, correspondence	91	*Not printed.*
Education, Report	3	*Printed.*
" publication of Text-Books, O. in C	42	*Not printed.*
" publication of French Grammar	43	"
" lecturers at School of Pedagogy	44	"
" Goderich High School	45	"
" Niagara Falls High School	46	"
" Toronto Junction High School	47	"
" Inspector of Model Schools, duties of	48	"
" County pupils attending High Schools	52	*Printed.*
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" names of authors and publishers of text-books	55	"
Elections, Returns	75	"
Elgin House of Industry, Report	39	*Not printed.*
Entomological Society, Report	12	*Printed.*
Estimates.	15	"

Title.	No.	Remarks.
Factories Inspectors, Report	25	*Printed.*
Farmers' Institute, Central, Report	84	"
Fire Ranging, expenditure	41	"
Fish and Game, Report	76	"
Forest Reservation and National Park, Report	31	"
Forestry, Forest Schools Management, Report	30	"
Fruit Growers', Report	13	"
Game and Fish, Report	76	*Printed.*
Gaols, Prisons and Reformatories, Report	9	"
Government Roads	78	"
Health, Report	28	*Printed.*
" regulations *re* cholera	66	"
" regulations *re* ice supply	67	"
Hospitals, Report	38	"
Houses of Refuge, Report	10	"
Ice, regulations *re* supply and storage	67	*Printed.*
Immigration, Report	18	"
Industries, Bureau of, Report	20	"
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Jones *vs.* Sharpe, correspondence	63	"
Judicature Act, commutation	33	"
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Kirkpatrick, Lieutenant-Governor	57	*Printed.*
Lands sold, amounts due on	68	*Printed.*
Legal Offices, Report	27	"
Librarian, Report	37	*Not printed.*
Lieutenant-Governor, appointment	57	*Printed.*
Liquor Licenses, Report	19	"
" number issued	49	"
" convictions in N. Ontario	88	*Not printed.*
Magdalen Asylums, Report	10	*Printed.*
Manley, conduct of	51	*Not printed.*
Medical Council, sums paid to members	86	*Printed.*
Middlesex Registry Office, vacancies in	58	*Not printed.*
Mines, Report of Bureau	85	*Printed.*
Mosgrove, Judge, commutation	34	*Not printed.*
Municipal indebtedness	89	*Printed.*
Municipal Taxation, Report	73	"
Municipal Treasurers, defalcations	79	"
Orphan Asylums, Report	10	*Printed.*
Ottawa Separate Schools, correspondence	50	"
Paget and Regan, correspondence	63	*Not printed.*
Pedagogy, lecturers	44	"
Pedgaogy, appointments and dismissals	54	*Printed.*

Title.	No.	Remarks.
Plebiscite Petitions	93	*Printed*
Poultry and Pet Stock, Report	82	"
Prisons, Report	9	"
Proton Commissioner	64	*Not printed.*
Public Accounts	14	*Printed.*
Public Works, Report	24	"
Queen Victoria Niagara Falls Park, Report	69	*Printed.*
Railway Documents	59	*Printed.*
Refuge, Houses of, Report	10	"
Registrars' fees	81	"
Roads and Bridge expenditure	78	"
Scott Act By-laws	87	*Not printed.*
Secretary and Registrar, Report	90	*Printed.*
Statutes, Revised, disposal of	35	*Not printed.*
Statutes, Sessional, disposal of	36	"
Tavern and Shop Licenses, Report	19	*Printed.*
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Timber berths, offered for sale in 1892	62	"
Timber berths, purchasers in 1890	74	"
Timber sales from 1871	92	"
Timber, estimated quantity	72	"
Titles, Report of Master	61	"
Toronto General Trusts Company	56	*Not printed.*
Toronto Normal School, appointments, etc.	54	*Printed.*
Toronto University, Report	70	"
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" Finance Report	21	"
Upper Canada College, Report	29	*Printed.*
York Branch River Bridge	80	*Not printed.*
York House of Industry, Report	40	"

LIST OF SESSIONAL PAPERS.

Arranged in Numerical Order with their Titles at full length ; the dates when Ordered and when presented to the Legislature ; the name of the Member who moved the same, and whether Ordered to be Printed or not.

CONTENTS OF PART I.

No. 1.. Report of the Standing Committee on the Faculty of Medicine, University of Toronto, on the subject of Re-organization. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 2.. Report of the Commissioners appointed to enquire into the practice of Dehorning Cattle. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 3.. Report of the Minister of Education for the year 1892, with Statistics of 1891, in which is included the Reports upon the Scientific Institutions and School of Practical Science. Presented to the Legislature, 5th April, 1893. (*Printed.*)

CONTENTS OF PART II.

No. 4.. Report of the Inspector of Insurance and Registrar of Friendly Societies for the year 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 5.. Report relating to the Registration of Births, Marriages and Deaths for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

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No. 6.. Report upon the Ontario Institution for the education and instruction of the Blind, Brantford, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed*)

No. 7.. Report upon the Ontario Institution for the education of the Deaf and Dumb, Belleville, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 8.. Report upon the Lunatic and Idiot Asylums of the Province for the year ending 30th September, 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 9.. Report upon the Common Gaols, Prisons and Reformatories, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 10.. Report upon the Houses of Refuge and Orphan and Magdalen Asylums for the year ending 30th September, 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 11.. Report of the Agriculture and Arts Association for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 12.. Report of the Entomological Society for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 13.. Report of the Fruit Growers' Association for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 14.. Public Accounts of the Province for the year 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 15.. Estimates for the service of the Province until the Estimates of the year are finally passed. Presented to the Legislature, 5th April, 1893. (*Not printed.*) Estimates for the year 1893. Presented to the Legislature, 5th April, 1893. (*Printed.*) Estimates required for the service of the Province until the Estimates for the year are finally passed. Presented to the Legislature, 1st May, 1893. (*Not printed.*) Estimates (supplementary) for the year 1893. Presented to the Legislature, 25th May, 1893. (*Printed.*)

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No. 16.. Report of the Dairymen's and Creameries' Associations of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 17.. Report of the Commissioner of Crown Lands for the year 1892. Presented to the Legislature, 18th April, 1893. (*Printed.*)

No. 18.. Report of the Department of Immigration for the year 1892. Presented to the Legislature, 5th May, 1893. (*Printed.*)

No. 19.. Report upon the working of the Tavern and Shop Licenses Act for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 20.. Report of the Bureau of Industries for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 21.. Report of the Standing Committee on Finance, University of Toronto. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 22.. Report of the Ontario Agricultural College and Experimental Farm for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 23 . Report for the Canadian Institute for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 24.. Report of the Commissioner of Public Works for the year 1892. Presented to the Legislature, 12th April, 1893. (*Printed.*)

No. 25.. Reports of the Inspectors of Factories of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 26.. Report of the Inspector of Division Courts for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 27.. Report of the Inspector of Legal Offices for the year 1892. Presented to the Legislature, 2nd May, 1893. (*Printed.*)

No. 28.. Report of the Provincial Board of Health for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 29.. Report of Upper Canada College for the year ending 30th June, 1892. Presented to the Legislature, 6th April, 1893. (*Printed.*)

No. 30.. Papers and Reports upon Forestry, Forest Schools, Administration and Management. Presented to the Legislature, 20th April, 1893. (*Printed.*)

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No. 31.. Report of the Royal Commission on Forest Reservation and National Park. Presented to the Legislature, 20th April, 1893. (*Printed.*)

No. 32.. Report of the Drainage Commission for the Province, 1892-3. Presented to the Legislature, 4th May, 1893. (*Printed.*)

No. 33.. Copy of an Order in Council commuting the fees payable to His Honour Judge Baxter, under the Surrogate Courts Act. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 34.. Copy of an Order in Council respecting the payment of Surrogate Court fees to His Honour, Judge Mosgrove. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 35.. Statement as to the disposal of the Revised Statutes for the year 1892. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 36.. Statement as to the disposal of the Sessional Statutes for the year 1892. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 37.. Report of the Librarian on the state of the Library. Presented to the Legislature, 6th April, 1893. (*Not printed.*)

No. 38.. Report upon the Hospitals of the Province for the year ending 30th September, 1892. Presented to the Legislature, 14th April, 1893. (*Printed.*)

No. 39.. Report of the House of Industry and Refuge, County of Elgin. Presented to the Legislature, 10th April, 1893. (*Not printed.*)

No. 40.. Report on the House of Industry, County of York. Presented to the Legislature, 10th April, 1893. (*Not printed.*)

No. 41.. Return to an Order of the House, of the sixth day of April, 1892, shewing the expenditure in each year, since the system of fire ranging has been established for that service, the amount of refunds in each year, and the amount remaining unpaid on account of the licensee's share of the expenditure. Presented to the Legislature, 10th April, 1893. Mr. *Meredith.* (*Printed.*)

No. 42.. Copy of an Order-in-Council approving of certain agreements in regard to publication of Text Books. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 43.. Copy of an Order-in-Council respecting a certain indenture of agreement in regard to the publication of the High School French Grammar. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 44.. Copy of an Order-in-Council respecting the appointment of Lecturers at the School of Pedagogy for the Session of 1892-93. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 45.. Copy of an Order inCouncil raising the High School at Goderich to the status of a Collegiate Institute. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 46.. Copy of an Order-in-Council relating to the establishment of a High School at Niagara Falls. Presented to the Legislature, 11th, April, 1893. (*Not printed.*)

No. 47.. Copy of an Order-in-Council respecting the establishment of a High School at Toronto Junction. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 48.. Copy of an Order-in-Council respecting the performance, during his absence through illness, of certain of the duties of the Inspector of Model Schools. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 49.. Return to an Order of the House of the seventeenth day of March, 1892, for a Return shewing the number of liquor licenses issued in each year from 1876 to 1891, both inclusive. The gross fund raised from licenses in each of the same years. The sums paid out of the said fund in each of the same years to the Province and the Municipalities respectively, and the sums the Municipalities have imposed by by-law over and above the Statutory Duties in each of the same years. Presented to the Legislature, 12th April, 1893. Mr. *Clancy.* (*Printed.*)

No. 50.. Return to an Order of the House of the twenty-third day of March, 1892, for a Return of copies of all correspondence between Mr. Inspector White and the Board of Separate School Trustees of the City of Ottawa, together with copies of all reports made by the Inspector to the said Board, with reference to the Separate Schools of the City, during the year 1891. Presented to the Legislature, 12th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 51.. Return to an Order of the House of the twenty-fifth day of March, 1892, for a Return of copies of all correspondence between the Minister of Education, Sir Daniel Wilson, and one Manley, late caretaker or janitor of the School of Practical Science, or any other person or persons, relating to the conduct of said Manley while janitor, and his dismissal from said position. Presented to the Legislature, 12th April, 1893. Mr. *Whitney.* (*Not printed.*)

No. 52.. Return to an Order of the House of the eleventh day of April, 1892, for a Return shewing the number of County pupils attending High Schools or Collegiate Institutes in Towns separated from Counties for Municipal purposes, for each of the past three years ending 30th June; the amounts paid by said Counties to the said High Schools and Collegiate Institutes

for the same period; the amounts paid by said Counties to the said High Schools and Collegiate Institutes under the High Schools Act of 1891. Presented to the Legislature, 12th April, 1893. Mr. *Preston.* (*Printed.*)

No. 53.. Statement of Bonds and Securities registered by Officers of the Province during the year 1892. Presented to the Legislature, 14th April, 1893. (*Not printed.*)

No. 54.. Return to an Order of the House of the twenty-fifth day of March, 1892, for a Return giving the names of all persons who have been appointed to, who have resigned and been dismissed from positions in the Toronto Normal School, the Toronto Model School and the School of Pedagogy, within the last five years, together with copies, in each case, of all correspondence relating to the same between the Minister of Education or any member of the Government, or any officer of the Department of Education and the parties in question, or any other person or persons. Also, copies of all petitions, memorials and communications addressed to the Minister of Education, or any member of the Government, on the part of any, or all of the students of the Toronto Normal School, the Toronto Model School and the School of Pedagogy, within the last five years, and of any replies thereto on the Department of Education or the Government. Presented to the Legislature, 14th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 55 . Return to an Order of the House of the fourth day of April, 1892, for a Return shewing the names of all authors and publishers of Public and High School text-books, with the respective books published by them and the prices thereof. Also, for the copies of all correspondence by or with the Minister of Education, or any officer of his department, respecting the price or publication of Public or High School text-books, subsequent to that already brought down. Presented to the Legislature, 14th April, 1893. Mr. *Kerns.* (*Printed.*)

No. 56.. Report of the Toronto General Trusts Company for the year 1892. Presented to the Legislature, 17th April, 1893. (*Not printed.*)

No. 57.. Copy of Commission appointing the Honourable George Airey Kirkpatrick, P.C., to be Lieutenant-Governor of the Province of Ontario, and of the instructions thereto attached. Presented to the Legislature, 20th April, 1893. (*Printed.*)

No. 58.. Return to an Order of the House of the tenth day of April, 1893, for a Return shewing how often, in the past ten years, the office of Registrar of Deeds for the North and East Ridings of the County of Middlesex has become vacant; the dates when the vacancies occurred and when they were filled, and, if the office is now vacant, how long the vacancy has continued. Presented to the Legislature, 20th April, 1893. Mr. *Meredith.* (*Not printed.*)

No. 59.. Papers and Documents relating to the Kingston, Napanee and Western Railway Company, the Ottawa, Arnprior and Parry Sound Railway Company, the Irondale, Bancroft and Ottawa Railway Company, and the Central Counties Railway Company. Presented to the Legislature, 25th May, 1893. (*Printed.*)

No. 60.. Analysis of Reports of Electoral District and Township Agricultural and Horticultural Societies in Ontario for the year 1892. Presented to the Legislature, 21st April, 1893. (*Not printed.*)

No. 61. Report of the Master of Titles for the year 1892. Presented to the Legislature, 21st April, 1893. (*Printed*)

No. 62. Return to an Address to His Honour the Lieutenant-Governor of the 12th day of April, 1893, praying that he will cause to be laid before this House a Return of the timber berths offered for sale at the sale of 13th October, 1892, and of the births then sold, including those sold by private contract after the auction sale, with the area of each berth, the price *per* square mile paid, the names of the several purchasers, the sums received on account of purchase money, the date of the payment thereof and the sums (if any) remaining unpaid on the 1st January, 1893, and shewing whether any, and if so which of the said berths had been previously sold, and when and to whom and for what price, and also for a return of a copy of the advertisement and conditions of sale, and of the Order in-Council authorizing the sale. Presented to the Legislature, 24th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 63. Return to an Order of the House of the 4th day of April, 1892, for a Return of copies of all correspondence between the Commissioner of Crown Lands, or any officer of the Department of Crown Lands and George Paget and John Regan, or either of them, on the subject of, or with reference to an action in the High Court of Justice, Queen's Bench Division, between F. J. Jones plaintiff, and James Sharpe, Peter McDermott, George Paget and John Regan defendants, which said action was tried, or partially tried, before the Honourable Mr. Justice Rose at Hamilton, on the 2nd day of October, 1890, and settled by the parties thereto. Giving also, copies of all correspondence between the said Commissioner, or any such officer, and any other person or persons on the subject of or with reference to, the said action. Presented to the Legislature, 24th April, 1893. Mr. *Whitney.* (*Not printed.*)

No. 64. Return to an Address to His Honour the Lieutenant-Governor of the first day of April, 1892, praying that he will cause to be laid before this House a copy of the Order in-Council for the appointment of a Commissioner to examine into the claims of the Township of Proton in respect of the Land Improvement Fund, of the Commission used in pursuance thereof, and for a statement in detail of all expenses incurred in respect of the enquiry and report. Presented to the Legislature, 25th April, 1893. Mr. *Meredith.* (*Not printed.*)

No. 65. Copy of an Order-in Council adopting the first agreement of submission to the Arbitrators appointed for the settlement of the accounts between the Government of the Dominion of Canada and the Governments of the Provinces of Ontario and Quebec, and as between the said Provinces of Ontario and Quebec. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 66. Regulations of the Provincial Board of Health, with respect to Cholera, approved by Order in-Council, dated 11th April, 1893. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 67. Copy of an Order-in-Council approving of the Regulations respecting the sources of supply and the place of storage of Ice intended for domestic use or cooling purposes, adopted by the Provincial Board of Health. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 68. Return in part, to an Order of the House of the eleventh day of April, 1892, for a Return shewing by Townships the amount remaining unpaid on the

31st December last on lands sold, of (1) Crown Lands, (2) Common School Lands, (3) Grammar School Lands, (4) Railway Lands, and the aggregate amount due in respect of each of the said classes of lands, distinguishing the amounts due for principal and interest respectively. Presented to the Legislature, 26th April, 1893. Mr. *Meredith.* (*Printed*)

No. 69.. Report of the Commissioners for the Queen Victoria Niagara Falls Park. Presented to the Legislature, 28th April, 1893. (*Printed.*)

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No. 70.. Report of the University of Toronto for the year 1891-92, including the Reports of the University and College Councils, together with the Bursar's statement for the year 1892. Presented to the Legislature, 17th May, 1893. (*Printed.*)

No. 71.. Return to an Order of the House of the eleventh day of April, 1892, for a Return shewing the number of bodies received by the Inspector of Anatomy, during each of the past five years from (1) Charitable Institutions (2) Criminal Institutions and (3) all other sources in the Province. Shewing also, the number of persons who have died from natural causes in each of the above named institutions during the same period, and the number of the criminal class who had spent ten years or more in prison before dying in prison, and the number of persons who during the same period have died at the hands of the executioner. Presented to the Legislature, 1st May, 1893. Mr. *Meacham.* (*Printed.*)

No. 72.. Return to an Order of the House of the ninth day of March, 1892, for a Return, shewing the estimated quantity of Pine Timber now standing upon the Crown domain of the Province and the estimated value thereof, setting the same forth as far as practicable by a description, by number or otherwise, of the berths upon which the same is standing, and where the territory has not been divided into timber berths, shewing the localities as far as practicable, and also shewing the data upon which such estimates are based, as far as practicable. Presented to the Legislature, 1st May, 1893. Mr. *Wood* (*Hastings*) (*Printed*)

No. 73.. Report of the Commission on Municipal Taxation. Presented to the Legislature, 5th May, 1893. (*Printed.*)

No. 74.. Return to an Address to His Honour the Lieutenant-Governor of the twelfth day of April, 1893, praying that he will cause to be laid before this House a Return of the names of the several purchasers of the timber berths disposed of at the sale of October, 1890, and of the sales, if any, which were not carried out, and of the amounts, if any, remaining unpaid on account of the purchase money, if any, of such of lots and of a copy of the Order in Council authorizing the sale and of the advertisement and conditions of sale Presented to the Legislature, 4th May, 1893. Mr. *Campbell* (*Algoma.*) (*Printed.*)

No. 75.. Return from the Records of the several Elections to the Legislative Assembly, in the Electoral District of the City of Toronto, of the County of Peel, and the City of Toronto, since the General Election of 1890, shewing:— (1) The number of votes polled for each candidate in each Electoral District in which there was a contest. (2) The majority whereby each successful candidate was returned. (3). The total number of votes polled in each District. (4) The number of votes remaining unpolled. (5) The

number of names on the Voters' List in each District. (6) The population of each District as shewn by the last census. Presented to the Legislature, 22nd May, 1893. (*Printed.*)

No. 76.. Report of the Ontario Game and Fish Commission. Presented to the Legislature, 11th May, 1893. (*Printed.*)

No. 77.. Return to an Order of the House of the third day of May, 1893, for a Return of copies of all correspondence between the License Inspector of North Brant, or other parties, and the License Department, of any member of the Government, in connection with the application of William T. Jenkinson for a tavern license in polling sub division No. 10, Brantford Township. Presented to the Legislature, 8th May, 1893. (Mr. *McCleary.*) (*Not printed.*)

No. 78.. Return to an Order of the House of the nineteenth day of April, 1893, for a Return shewing, separately for each County, the expenditure on colonization, Government, or County Roads and Bridges, by the Crown Lands Department, in the Counties of Victoria, Peterborough, Hastings. Addington and Frontenac during the year 1892, with the location and amount expended on each road and bridge, and giving the name of the overseer in charge, and the amount received by such overseer, for his own services out of each expenditure. Presented to the Legislature, 8th May, 1893. Mr. *Wood* (*Hastings*) (*Printed.*)

No. 79.. Return to an Order of the House of the twenty-third day of March, 1892, for a Return shewing amounts of defalcations made by the Treasurers of any of the Municipalities in the Province of Ontario during the years 1871 to 1891, both inclusive. Shewing also, the amounts any of said municipalities have lost during the same time for want of sufficient sureties being given by said Treasurers, and also shewing the number of Commissions of Enquiry into the finances of municipal corporations issued during said years under Section 383 of the Municipal Act. Presented to the Legislature, 9th May, 1893. Mr. *Balfour.* (*Printed.*)

No. 80.. Return to an order of the House of the nineteenth day of April, 1893, for a Return of copies of all correspondence in connection with an application for a new Bridge over York Branch River, between lots 20 and 21, in the Township of Carlow, in the County of Hastings, during the year 1892, and all papers or memoranda connected therewith. Presented to the Legislature, 10th May, 1893. Mr. *Wood* (*Hastings.*) (*Not printed.*)

No. 81.. Returns of all Fees and Emoluments received by the Registrars of Ontario for the year 1892, under the provisions of R.S.O. 1887. cap. 114, sec. 100, with which are contrasted receipts of the same nature in the years 1890 and 1891. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 82.. Reports of the Poultry and Pet Stock Associations for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 83.. Report of the Bee-Keepers Association for the year 1892. Presented to the Legislature, 12th May, 1891. (*Printed.*)

No. 84.. Report of the Central Farmers' Institute for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 85.. Report of the Bureau of Industries for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 86.. Return to an Order of the House of the fifth day of May, 1893, for a Return from the Treasurer of the Medical Council, giving a detailed statement of the sums paid to each member of the Medical Council during the past five years, for travelling expenses and hotel accommodation while attending Council and Committee meetings, and also of the details of the amount not down in the financial returns for 1890, 1891 and 1892, under the heading "Expenses of Legislation." Presented to the Legislature, 12th May, 1893. Mr. *Waters.* (*Printed.*)

No. 87.. Return to an Order of the House of the 10th day of May, 1893, for a Return shewing the number of votes polled in favor of, and against, the Scott Act By-laws when last carried in the different Counties and Cities of this Province. Also, the number of votes polled when the same Counties or Cities repealed such By-laws, and including the vote in those Counties and Cities where the By-laws, under this Act, did not pass. Presented to the Legislature, 16th May, 1893. Mr. *Gibson* (*Huron.*) (*Not printed.*)

No. 88.. Return to an Order of the House of the tenth day of May, 1893, for a Return of all convictions under the Liquor License Act in the Riding of North Ontario during the years 1891 and 1892. Also, of all moneys paid to the License Inspector for salary and expenses during said years, distinguishing the amounts paid for salary and the amounts paid for expenses. Also, of the particulars of any fines which may have been remitted during said years. Also, of the gross amounts of money received by the inspector in his official capacity during said two years, and a detailed statement of the amounts disbursed by him during the same time, shewing to whom and for what such disbursements were made. Presented to the Legislature, 16th May, 1893. Mr. *Glendinning.* (*Not printed.*)

No. 89.. Statement of the amounts loaned to the Municipalities of the Province under the Tile, Stone and Timber Act from 1st January, 1890, to 31st December, 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 90.. Report of the Secretary and Registrar of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 91.. Return to an Order of the House of the fifth day of May, 1893, for a Return of copies of all correspondence between the Government and the License Commissioners of the County of Dufferin, or any other parties, concerning the resignation of the late License Inspector for the County, Mr. Anderson. Also, for copies of all correspondence between the Government and the said License Commissioners, or other parties, concerning the appointment of the present Inspector, Mr. Dodds. Presented to the Legislature, 19th May, 1893. Mr. *Barr* (*Dufferin.*) (*Not printed.*)

No. 92.. Return to an Order of the House of the twenty-fourth day of April, 1893, for a Return giving, except that already brought down, the dates of all Crown Timber Sales from 1871, as follows: The date of sale, the number and extent of the different timber berths in square miles, and the prices obtained at each such sale, *per* square mile. Presented to the Legislature, 22nd May, 1893. Mr. *Preston.* (*Printed.*)

No. 93.. Return to an Order of the House of the nineteenth day of May, 1893, for a Return shewing the number of petitions that have been presented to the House during the present Sessi n asking for a plebiscite on the temperance question from temperance societies, churches and municipal corporations, giving the numbers from each in the order named. Also, shewing the nnmbers fr:m each of the above-named bodies in favor of Provincial or other Prohibition, respectively. And the number of Petitions in favor of Bill (No. 70,) To prohibit the sale of intoxicating liquors by retail. Presented to the Legislature, 23rd May, 1893. Mr. *Field*. (*Printed*.)

FIFTH ANNUAL REPORT

OF THE

CANADIAN INSTITUTE,

SESSION 1892-3,

BEING

AN APPENDIX

TO THE

REPORT OF THE MINISTER OF EDUCATION,

ONTARIO.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
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ARCHÆOLOGICAL REPORT.

By David Boyle.

To the President and Members of the Canadian Institute:

Gentlemen,—As I have been employed during the past year on work that prevented as much time as I could wish being devoted to the archæological field, and as the council has consented to exhibit a typical selection from our cabinets at the World's Columbian Exposition to be held in Chicago during the present year, the occasion seems opportune to review in a very general way what has been accomplished since the Canadian Institute undertook the formation of an Archæological Museum.

It is true that almost from the establishment of the society by Royal Charter in 1852, one of the most cherished objects of the leading members was to collect information regarding places throughout the Province that were in any way connected with the Indians, and to bring together, for preservation, specimens of aboriginal tools, weapons, utensils and ornaments.

This purpose was no doubt mainly influenced by a very general movement among the most advanced nations in Europe along archæo-anthropological lines. In France, Germany, Switzerland, Denmark and our own Mother Country, attention had been for some time directed to the study of early man, in so far as such study might be prosecuted by an examination of his relics, and by comparing those of one country with those of another.

Only mention need be made of Dr. Schmerling's discoveries in the Belgian caves in 1833; of the pre-historic human remains found in the Dusseldorf cave; of the Danish Kitchen-middens and the Swiss Lake-dwellings; of the important discoveries made by M. Boucher de Perthes at Abbeville, and of the numerous evidences collected relative to early man in the valleys of the Thames, the Seine, the Somme, the Rhine, and in many other localities in widely separated portions of Europe.

In view of this great intellectual movement it was inevitable that its influence should reach America, and we accordingly find that in 1854 the council of the Canadian Institute issued a circular asking for such particulars as might be in possession of non-members with regard to the existence of village sites, burial places, etc., but there is no reason to suppose that the results were very encouraging. The nucleus of an archæological collection was formed, but as no case-room was provided (the specimes being simply placed on open shelves) the relics in possession of the Institute in 1886 were neither numerous nor valuable. In that year a small private collection was presented to us, and cases were supplied for future accessions.

With the consent of the council, your curator decided to specialise his efforts archæologically, on the ground that, with the advance of settlement, traces of early occupation would speedily disappear, and that, in any event, it was high time to preserve for the examination and study of our own people such evidences of aboriginal life as too many persons seemed anxious to deport to the museums of foreign countries.

As soon as the success of the project appeared to be assured, application was made to the Provincial Legislature for assistance on the exceedingly valid plea that while the work would be carried on by the Canadian Institute, it would be, in character and scope national, not local.

On this understanding, a small sum was placed in the estimates for archæological research, and a like amount has since been voted annually. Without such aid it would be wholly impossible to prosecute the work at all satisfactorily, and it is especially gratifying to be able to state that not only have our efforts in all directions been so eminently successful, but we have been rewarded with high praise from all whose opinions are worth anything on this subject.

Our annual reports, of which the present is the sixth issue, have done more than a little towards educating public taste in the study and preservation of what relates to pre-historic associations in Ontario and elsewhere, and the demand for copies from the Institute has increased to such an extent that for the last three years the supply has been insufficient.

Members of the Legislature, too, agree in stating that they have applications for these reports far in excess of their ability to satisfy.

The publications in question are simply records of what has been done here and there, and of accessions to the Museum, but they have awakened so much interest throughout the province, that there are now invitations for your curator to visit as many places as would occupy the whole of two or more seasons.

It is much to be regretted that this kind of work cannot be systematically undertaken. Sometimes well-meaning residents make the attempt, but too often observations of an important character are wholly overlooked—more frequently nothing is done, and the plough eventually obliterates all traces of what might have proved an instructive spot, or a place of "treasure trove."

With the increase of material, every year adds to the difficulty of accommodating the collection. The large room occupying the whole uppermost story of the Institute's building has long been overcrowded, and a considerable number of specimens have been placed in the Library. Extension can proceed but little further under the present arrangement, and increased accommodation must, before long, be found here or elsewhere.

As a mere matter of business the collection is worth many times what it cost, whilst from an educational and scientific point, its value is inestimable, and it is deeply to be regretted that no better place for its accommodation can be found in Toronto.

During the year we have become possessed of three small, but in some respects, valuable private collections. One of these was the property of Mr. E. C. Waters, of Brantford; a second belonged to Chief A. G. Smith, of the same city, while the third was the property of Mr. F. W. Waugh, also of Brantford. The first is especially rich in implements of bone and horn, and includes several unique specimens in stone and clay. Mr. Waugh's is miscellaneous, but comprises some rare specimens. That of Chief Smith is remarkable mainly for stone pipes, and for a very fine assortment of post-European silver ornaments, including brooches, pins, bracelets and hat-bands, all of the kind formerly given to the Indians as "presents."

Since the issue of the last report, too, we have received from Dr. T. W. Beeman, of Perth, a large number of excellent specimens found by himself and others in the County of Lanark.

Mr. T. W. Irwin, of Peterborough, has presented us with a large and beautiful clay vessel found in a rock-cleft on the divide between the waters flowing into the Ottawa, and those that reach the Bay of Quinte, and valuable specimens of various kinds have been presented by Messrs. Archibald Riddell, of Arnprior; W. McDonnell, J.P., of Lindsay; David Allan, of Rylston, and others, to all of whom we beg to express our gratitude.

We have also to thank Mr. E. F. White, of Clarksburg, for depositing with us a very fine specimen of pottery in perfect condition. It was found in the Blue Hills of Nottawasaga.

Special thanks are also due to Mr. W. G. Wright, of Collingwood, for his donation of fifty-six specimens, some of which are very valuable. A few of them are figured in the following pages.

Yours respectfully,
DAVID BOYLE.

Toronto, March 1st, 1893.

NOTES.

It appears to be tolerably certain that when the French took possession of Canada, both banks of the St. Lawrence west of Montreal, part of the territory lying south of Lake Ontario, and probably most of that lake's northern shore were regarded by the Iroquois as their country. The territory of the Neuters, or Attiwandarons, extended along the northern shores of Lake Erie and for some distance inland, occupying the whole of the Niagara peninsula and stretching eastwards on the south of Lake Ontario until it marched with the country of the Iroquois. North of the Neuters, and occupying most of the area bounded on the west and north by Lake Huron and the Georgian Bay, were the Hurons, akin to the Iroquois, but long separated from them.

The areas referred to comprised the greater portion of old Upper Canada, or what is the southern part of the Province of Ontario as now constituted.

Natives of Algonquin stock seem to have been confined to the territory lying still further to the north, on both sides of the Ottawa, and westwards, even beyond Lake Superior. After the extermination of the Hurons and the Neuters by the Iroquois, and when the conquerors had themselves ceased to be a terror, the Ojibwas or Chippaways gradually took possession of the country formerly held by the tribes mentioned, and it was with the Ojibwas the British authorities had to deal after Canada was ceded by the French.

Before proceeding to the point to which this leads, it may prove interesting to say a word or two regarding the various land surrenders made by the natives to the British Government, for it must be borne in mind that the territorial rights of the Indians were always admitted by the home authorities. These rights were fully recognised by the proclamation of George III., 7th October, 1763, and it is somewhat curious to remark that the first purchase made from the Indians of this country was "for ten shillings, and divers good and valuable considerations given on 23rd September, 1787," for what now forms the southern portion of the County of York, embracing the townships of Etobicoke, York and Scarboro'; although the surrender was not completed by the Mississagas until the 1st of August, 1805.

In the following year a strip of similar width extending from the western limit of the former tract to the mouth of Burlington Bay, and containing 85,000 acres, was surrendered by the Mississagas for the sum of £1,000 sterling. All the other land purchases were made from the Chippaways, of whom the Mississagas and Saugeens were tribes.

But the knowledge that within the scope of history there has been a double aboriginal occupation of the Province fails in any degree to account for much that characterises certain classes of relics which appear to be of a more archaic type than others. It is undoubted that among the specimens found in almost

any given locality, there is a larger or smaller proportion of chipped objects somewhat rude in form and finish, corresponding in the main with those that are known in Europe as palœoliths. Some of the pipes, too, but more rarely, are of forms usually considered ancient when compared with others, and there seems reason to doubt whether most or many of the so-called "ceremonial weapons" were used for any purpose by natives contemporary with European settlers.

The chipped objects referred to include, of course, all those forms known as arrow-heads, spears, lances and knives, and which are usually characterised by a lack of that symmetry, gracefulness of outline, and proportion of parts so much admired in what we regard as "choice specimens."

Hitherto, a very general belief has been entertained that the ruder forms were merely blocked out preparatory to higher finish, or, that they were makeshifts, or, that they were the work of non-adepts, or, that they were "rejects," and while there is still good ground for holding such views in a very large number of instances, there is, at the same time, a tendency on the part of not a few students to wonder whether some of the coarsely-flaked, neckless, and much-weathered specimens are not actually the counterparts of what are known elsewhere as palœoliths, pointing to a time and condition of existence on the part of a people long prior to the fifteenth century, near the close of which European intercourse began with the natives of this continent.

In several widely-separated parts of the United States, what may be called the palœolithic proof appears to be conclusive, and while it would seem reasonable to believe that similar evidences should exist in Ontario, none has been forthcoming so far. Here we have no indisputable proof that even a flake of flint has been discovered in a bed of gravel or of boulder clay, otherwise than by comparatively recent intrusion. Workmanship alone affords grounds for the conjecture that some chipped stone implements and weapons antedate others, and, as has already been mentioned, it is quite possible to account for the variations on totally different grounds.

With regard to pipes, however, similar arguments will not so readily apply, for it is tolerably safe to assert that the production of these, and the practice of smoking, belong to a period long subsequent to that of pre-glacial or even co-glacial man, and to a condition of society far in advance of the palœolithic. When man became a smoker he ceased to be purely and simply a savage, for whether we connect the practice of smoking with early man's ideas of indulgence, or of superstition, it points, at all events, to a stage in his advancement when food quest had ceased to be his all-absorbing occupation, and when sentiment had begun to exercise its sway in ministering to what he was pleased to regard as his comfort, or for the purpose of appeasing the many spirits with which he peopled his surroundings.

The making of pipes also demanded a higher, though, perhaps, not more difficult degree of mechanical skill in the manipulation of clay or of stone than was involved in the act of chipping to produce a cutting edge. But, although for these reasons, it is quite plain that pipes came in long subsequent to the time when the rudest forms of stone implements were in use, it is, nevertheless, not very hard to distinguish the evolution of the former from what we consider their most archaic to their most recent types, although individual specimens are occasionally somewhat perplexing.

Still, there is another difficulty. Just as we find the coarsest flints mingled with those that are most beautifully made, now and then we discover a pipe of antique shape buried with material that we have reason to believe

comparatively recent. Were the old pipes heirlooms—family fetishes perhaps, —were they only "finds" to some succeeding Indian, as they are to ourselves, or, were some of those we look upon as ancient pipes after all simply reproductions of old patterns? Who shall say? If we may form our conclusions from the writings of travelers, and from what we know to be yet the practice among outlying tribes, the ceremonial pipe was distinguished from others both in point of size and grandeur, but even this is a little hazy, and we are to a great extent in ignorance of the whole part played by the pipe among pre-historic Indians.

It has long been found convenient by writers and students to refer all Indian "goods and chattels" of unknown use to the catalogue of "ceremonial" objects. The list has become a very large one, and is likely to increase, although there can be little doubt that if our knowledge were as extensive as our possessions the number of ceremonial articles would be very materially reduced. A considerable proportion of these relics are made of Huronian slate, which is often found so beautifully veined, or grained, as to be highly suggestive of petrified wood to a common observer. The objects made of this material are among the most beautiful specimens of primitive handicraft found in North America, and easily rank first among the Indian relics of Ontario. To whatever use assigned, they must always have possessed a high value, and one would naturally suppose that they must have been conspicuous objects on the person, or connected with the persons of their owners. If worn as charms or amulets, they would have been very noticeable—if employed in dances, feasts or pow-wows they could scarcely have failed to attract the attention of onlookers, and yet amid all that has appeared respecting "The Manners and Customs of the North American Indians," we search in vain for information with regard to those so-called "ceremonial" objects of stone. We find tolerably minute descriptions of head-dresses, masks, mantles, robes, leggins, moccasins, wampum belts, necklaces of various kinds, bracelets, ornaments of feathers and porcupine quills, dyes and pigments, but not a word about "ceremonial" stones—some of which were conventionalised forms of quadrupeds and birds, some elegantly formed bars (in all these cases having a hole bored diagonally through the base at each end), some like double-edged axes, some resembling pairs of horns, some like butterflies, and others of various fanciful shapes, but always with a hole apparently for the reception of a handle, or perhaps for suspension. Regarding these not a syllable has been written to satisfy our curiosity.

It is particularly noteworthy that specimens of the kind in question are nearly always found absolutely perfect, free from marks of abrasion or wear, and not even a sign of friction about the holes.

Some students wonder very pertinently whether these objects had not actually gone out of use previous to the appearance of the white man, and here again we are confronted with the possibility of another occupation by a people previous to that of the tribes found in possession by the French.

With regard to surmises of this kind, there is presumably no desire to point to dispersed or supplanted races of totally different origin, as is sometimes done when mention is made of the Mound-Builders, but rather to such speedy and overwhelming extirpations of tribe by tribe as have fallen within historic scope.

The art of flint-flaking is still practiced by some of the North-west Indians, but so far as is known nothing corresponding to ceremonial stones has been produced by any aboriginal people during the historic period.

Not taking into account the stone tubes and the varieties known as amulets and gorgets, all the so-called "ceremonial" objects, as has already been remarked, are provided with a hole as if for the insertion of a thin shaft or handle, the aperture seldom exceeding three-eighths of an inch in diameter, and if this was the purpose of the hole it would seem all the more remarkable that our Indians did not thus attach handles to their tomahawks and hammers, as was the custom of Old World primitive man. Until very recently I had not seen a single stone hammer or celt belonging to this Province with a hole large enough to warrant the belief that it had been made to receive a handle for working purposes, but an excellent specimen of such a tool has been presented to us by Dr. T. W. Beeman, of Perth, who procured it from Dr. Clark, of Tamworth. It was found at Beaver Lake, in the County of Addington. The hole is about nine-sixteenths of an inch in diameter, and both ends of the tool are considerably battered. It is four inches in length, and an inch and three-eighths in diameter at the eye, which, measuring from the centre, is only an inch and a half from one end, and, of course, two and a half from the other. The extremity of the shorter end is three-fourths of an inch in diameter, and rounded, while the opposite end is chisel or axe-edged.

Attention is called to the valuable paper by J. H, Coyne, Esq., M.A., of St. Thomas, on the "Southwold Earthworks," in the county of Elgin.

Appended is a list of the typical specimens that have been selected for exhibition at the Columbian Exposition, Chicago. To supply accommodation for these the Ontario Government has kindly furnished twelve large and handsome cases of cherry, having an area of one hundred and fifty square feet.

It is anticipated that as a result of this exhibition the Museum will receive many valuable accessions, illustrative not of early man in Ontario, or even in Canada, alone, but in many other parts of the world.

A large edition of this report will be issued for the catalogue it contains of the exhibit, and copies will be freely but judiciously distributed in Chicago.

Canadians and others into whose hands this report may come are hereby invited to correspond with the curator regarding the subject of archæology, and it is needless to say that contributions will be thankfully received from all well authenticated sources.

In so far as our spare material will admit, exchanges will be effected.

DAVID BOYLE,
Curator.

CATALOGUE OF SPECIMENS

On Exhibition at the Columbian Exposition, Chicago,
May 1st to October 31st, 1893.

from

THE PROVINCIAL ARCHÆOLOGICAL MUSEUM

of the

CANADIAN INSTITUTE, TORONTO,

Specimens Showing Methods of Working.

1. Small block of brown stone, marked off and partly sawn for beads.
12. Portion of a stone marked off for a pipe. Nottawasaga township, Simcoe county.
14. Stone showing remains of holes bored in line to separate it from another piece. Nottawasaga township, Simcoe county.
17. Unfinished tool—semi-circular blade. Middlesex county.
18. Huronian slate pebble almost divided into five lengths by deeply-cut notches. McGillivray township, Middlesex county.
19. Stone showing method of cutting by sawing. Nottawasaga township
21. Gorget or tablet partly bored. Western Ontario.
28. Large pebble pecked on one side to make it symmetrical.
34. Unfinished object in Huronian slate shows borings. McGillivray township, Middlesex county.
49. Limestone (deeply-channelled). Nottawasaga township, Simcoe county.
50. Large and roughly blocked out axe, Lanark county.
69. (?) Huronian slate. Nottawasaga, Simcoe county.
90. Large pebble dressed flat on one end. Lanark county.
97. Large "platform" steatite pipe, blocked out, ready for boring. Camden township, Addington county.
150. (?) Norfolk county.

Hammers.

15. Discoidal; hollowed on two sides. Western Ontario.
16. Large flat limestone pebble grooved. Biddulph township.

Hammers (Grooved).

1. Kingsville, Essex county.
2. Sebastopol township, Renfrew county.

Axes (Mostly Plain).

1. Victoria county (13½ inches long).
2. Victoria county (10½ inches long, 2 inches thick).
3. West Williams, Middlesex county (with longitudinal rib).

4. 5, 6, 7. Small specimens, Middlesex county.
8. Beaver lake, Addington county (with handle hole $\frac{3}{16}$ inch diameter).
9. Kent county (both ends sharpened).
79. Huronian slate, Norfolk county.
263. Slender tapering form, Norfolk county.
475. Strongly ridged on one side, Norfolk county.
509. Having ornamental pattern in relief on one side. Norfolk county.

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915. Small tool, half round transversely, pointed at one end.

Axes (Grooved).

10. East Williams township.
11. Leamington, Essex county. Grooved deeply, grooves surrounded with flanges.
12. Weston, York county.
13. Norfolk county.
25. Grooved vertically and horizontally. Lanark county.

Gouges.

8. Near Lindsay, Victoria county.
12. Pilkington township, Wellington county.
18. Victoria county.
19. Pilkington township, Wellington county.
29. McGillivray township (transversely grooved for handle attachment).
36. South Sherbrooke township, Lanark county.
38. Humberstone township, Welland county.
39. Sheffield township, Addington county.
40. Penetanguishene, Simcoe county (gouge and chisel at opposite ends).
41. Haldimand county.

Flaked Implements.

3, 4, 5, 6, 7, 8. Tidd's Island, R. St. Lawrence. (From 6 to 8½ inches long; 5 and 7 are of quartzite.)

15. Pickering township, Ontario county. (This is one of the largest chipped) implements found in Ontario, it is 11½ inches long).

16, 17, 18. Wolfe Island, River St. Lawrence.

20. Biddulph township, Middlesex county.

23. Plympton township, Lambton county.

24. McGillivray township, Middlesex county.

28–39. Eleven specimens found together at the edge of a swamp in West Williams township.

42. Wolfe Island, River St. Lawrence.

61–62. Wolfe Island, River St. Lawrence. (Two large roughly-flaked leaf-shaped tools).

70–110. Flints, Brant county.

141–142. Curved flints, Norfolk county.

269. Large scraper, Norfolk county.

Slate Spears.

4. Wolfe Island, R. St. Lawrence.
5. Western Ontario (notched shank).
10. Nottawasaga township, Simcoe county.
11. Withrow Ave., Toronto.
14. Nottawasaga township.
17. Ryleston, Northumberland county.

Tablets, etc. (One Hole).

5. Jarvis, Norfolk county.
8–9. Tidd's Island, R. St. Lawrence.
14. Galt, Waterloo county.
24. McGillivray township, Middlesex county.
25. Biddulph, Middlesex county.
30. McGillivray township, Middlesex county.
33. McGillivray township, Middlesex county.
34. Bosanquet township, Lambton county.
36. West Williams township, Middlesex county.
47. McGillivray township, Middlesex county.
48. Biddulph township, Middlesex county.
51. Humberstone township, Welland county.
52. No locality known.
57. Western Ontario.
58. Wolfe Island, R. St. Lawrence (chisel-edged).
59. Wolfe Island, R. St. Lawrence.
61. Wolfe Island, R. St. Lawrence.

Tablets (Two or More Holes).

1. St. Thomas, Elgin county.
3. Western Ontario.
4. Near Sarnia, Lambton county.
5. Galt, Waterloo county.
6. Orillia, Simcoe county.
13. Norwich, Oxford county
14. Exeter, Huron county.
15. London township, Middlesex county.
16. Plympton township, Lambton county.
28. West Williams township, Middlesex county.
29. Thedford, Lambton county.
32. West Williams township, Middlesex county.
33. West Williams township, Middlesex county.
34. McGillivray township, Middlesex county.
38. West Williams township, Middlesex county.
41. Biddulph township, Middlesex county.
42. Middlesex county.
43. McGillivray township, Middlesex county.
47. West Williams township, Middlesex county.
48. West Williams township, Middlesex county.
49. McGillivray township, Middlesex county.
53. Lindsay, Victoria county.

54. St. Thomas, Elgin county.
55. McGillivray (Huronite) Middlesex county.
62. Wolfe Island, R. St. Lawrence.
69. Elora, Wellington county.
70. Ellice township, Perth county.

Animal Forms in Slate and other Stone.

14. Wolf's or dog's head, Nottawasaga township, Simcoe county.
15. Finely-carved human head, Beverly township, Wentworth county.
16. Bird's head, Nottawasaga township, Simcoe county.
17. Beaver (?) Nottawasaga township, Simcoe county.
18. Bear (? Nottawasaga township, Simcoe county.
19. Turtle (sandstone) Elgin county.
87. Dog-like head (marble) Nottawasaga township, Simcoe county.

Miscellaneous (Slate).

10. Small disc, perforated with one central and ten marginal holes.
19. Sub-conical ornament, $1\frac{3}{4}$ in. in diameter, Burford village, Brant county.
30. East Williams township, Middlesex county.
31. West Nissouri township, Middlesex county.
41. Newmarket, York county.
53. Slate knife (?) Western Ontario.
54. Cobourg, Northumberland county.
55. Large semi-circular knife, Madawaska river, Renfrew county.
56–57. Pendants (?) Tidd's Island, River St. Lawrence.
64. Small perforated tool, chisel-edged at one end and pointed at the other Probably a pottery marker.
204. Paint cup (?) Norfolk county.

Ceremonial Stones (Bird Amulets).

1. Aurora, York county.
2. Middlesex county.
3. Thorndale, Middlesex county.
4. West Williams township, Middlesex county.
5. Locality not known.
6. Elgin county.
7. Brantford, Brant county.
8. Port Rowan, Norfolk county.
9. Biddulph township, Middlesex county.
10. London, Middlesex county.
11. McGillivray township, Middlesex county.
12. Stephen township, Huron county.
13. West Williams township, Middlesex county.
14. McGillivray township, Middlesex county.
16. McGillivray township, Middlesex county.
17. West Williams township, Middlesex county.
18. West Williams township, Middlesex county.

(Bar Amulets, etc.)

20. Bosanquet township, Lambton county.
21. Scotland village, Brant county.
23. West Williams, Middlesex county.
24. McGillivray township, Middlesex county.
25. Middlesex county (oval hole).
27. Port Rowan, Norfolk county.

(Horned and Winged Objects.)

26. Middlesex county.
28. McGillivray township, Middlesex county.
29. Spherical Huronian slate, bored. Hollowed in line with hole on one side, West Williams township.
29½. Huronian slate, bored, transversely and double pointed.
30. Wingham, Huron county.
31. Norfolk county.
32. Caradoc Township.
33. Plympton township, Lambton county.
34. Zone Township, Kent county.
35. Norfolk Lake shore.
36. Forest, Lambton county.
37. Wingham, Huron county.
38. Port Perry, Lake Scugog, Ontario county.
41. West Williams township, Middlesex county.
42. Blanshard Township, Middlesex county.
44. East Williams township, Middlesex county.
45. McGillivray, Middlesex county.
47. East Williams township, Middlesex county.
48. West Williams township, Middlesex county.
49. Biddulph township, Middlesex county.
51. Oval Huronian slate, bored, Middlesex county.
91. Oneida Township.

(Tubes.)

52. Middlesex county.
62. Forest.
63. Norfolk Lake Shore.
64. Norfolk Lake Shore.
66. Beverly township, Wentworth county.
67. Western Ontario.
68. Wolfe Island, River St. Lawrence.
69. Wolfe Island (8½ inches long).
72. McGillivray township, Middlesex county.
74. West Williams township, Middlesex county.
75. London township, Middlesex county.
85. Huron county.
87. East Williams township, Middlesex county.
90. Tuscarora township, Brant county.
92. Tuscarora township, Brant county.
93. Humberstone township, Welland county.
100. Brantford, Brant county (10 inches long).

DISCOIDAL STONES.

18. Middlesex county.
21-25. Eglinton, York county.

BONE AND HORN.

11. Part of human skull, rounded, and perforated with seven holes, Beverly township, Wentworth. county.
12. Portion of human skull, rounded, Vaughan township, York county.
24. Spear or harpoon (one barb) Beverly township, Wentworth county.
25. Spear or harpoon (three barbs) Victoria county. One end of this specimen is sharpened to a chisel edge.
28. Barbed fish-hook, Lindsay, Victoria county.
54. Small human figure, full length, hole through neck.
55. Small human mask, Nottawasaga township, Simcoe county.
56. Spear (one barb) York township, York county.
57. Hollow leg-bone (deer's?); highly polished and ornamented with three rows of rings deeply cut. York township, York county.
59. Chisel or gouge, Nottawasaga, Simcoe county.
70. Prongs of deer horn, probably used for smoothing or rounding thongs.
71-85. Awls or needles of various shapes and sizes, York township, York county.
86. Needle or pin with small hole, York township.
87-88. Probably pins for fastening articles of dress, York township, York county.
89. Wing-bones, notched preparatory to being cut into lengths, York township.
90. Wing bone slightly worked, York township.
91-92. Small foot-bones, partly worked, York township.
93-94. Similar bones, rubbed down, York township.
95-97. Bear's teeth, perforated as if for necklace, York township.
98-100. Wolf's teeth, similarly perforated, York township.
101. Five small bone beads, York township.
102-104. Three strings of bone beads, York township.
105. Small bone spear or harpoon, three barbs on each side.
106. Large bone awl, Nottawasaga.
107. Large spear or harpoon (four barbs on each side) Nottawasaga.
108. Bear's teeth, notched Nottawasaga.
203. Human leg-bone, bored, Simcoe, Norfolk county.
204-206. Of unascertained use, Baptiste Lake, Hastings county.
207. Ojibwa game (like cup and ball) Brant county.

SHELL.

1. Busycon perversa, Nottawasaga, Simcoe county. (Large sea-shell, the material of which was used in making wampum).
3. Wampum, or beads from columellæ of large shells, Beverly township.
4. Wampum, or beads from columellæ of large shells, Beverly township.
5. Section of shell, partly cut for wampum, Beverly township, Wentworth county.
6. Portion of large sea-shell, partly cut in preparation for wampum, Beverly township, Wentworth county.
21. Ornament (pendant) Beverly township, Wentworth county.
23. Two triangular pendants or ear-drops, made from unio shells, Nottawasaga.
39-43. Circular gorgets, London, Ontario.
53. Single piece of wampum, half-rounded and half-bored.

Stone Pipes.

2. Nottawasaga township, Simcoe county.
3. Nottawasaga township, Simcoe county.
5. Albion township, Peel county, (boring of bowl and stem incomplete.)
14. Nottawasaga, Simcoe county.
15. Nottawasaga township, Simcoe county.
16. Kent county.
21. Nottawasaga township, Simcoe county.
22. Nottawasaga township, Simcoe county.
24. Near Milton, Halton county. Monkey-like form.
28. Nottawasaga township, Simcoe county.
31. Beverly township, Wentworth county.
37. Nottawasaga township, Simcoe county.
43. West Williams township, Middlesex county.
44. Wiarton, Grey county.
45. Nottawasaga township, Simcoe county.
50. Lake Moira, Hastings county.
56. Pittsburg township, Frontenac county.
58. Sault Ste. Marie (modern form).
59. London township, Middlesex county.
60. Grand Bend, Sable R., McGillivray township, Middlesex county.
100. Nelson township, Halton county.
101. Kentucky shore, opposite Lawrenceburg (Ind.)
102. Penetanguishene, Simcoe county.
104. Ryleston, Northumberland county.
105. Unfinished pipe, Tuscarora township, Brant county.
110. Unfinished gypsum pipe, St. Clair Flats, Lambton county.
111. White stone pipe, Baptiste Lake, Hastings county.
112. Nottawasaga township, Simcoe county.

Clay Pipes.

2. Nottawasaga township, Simcoe county.
8. Nottawasaga township, Simcoe county.
19. Holland Landing, York county.
22. York township, York county.
35. Beverly township, Wentworth county.
47. Onentisati, Simcoe county.
49. Orillia, Simcoe county.
54. Nottawasaga township, Simcoe county.
80. Nottawasaga township, Simcoe county.
81. Nottawasaga township, Simcoe county.
82. Nottawasaga township, Simcoe county.
83. Nottawasaga township, Simcoe county.
85. Nottawasaga township, Simcoe county.
86. Nottawasaga township, Simcoe county.
89. Onentisati, Simcoe county.
90. Beverly township, Wentworth county.
91. Nottawasaga township.
96. Near Lake Simcoe (double faced).
110. Nottawasaga township, Simcoe county (wolf or dog-head).
114. Nottawasaga township, Simcoe county.

118. Nottawasaga township, Simcoe county (oddly flattened).
119. Nottawasaga township, Simcoe county (eagle's head).
120. Nottawasaga township, Simcoe county.
121. Nottawasaga township, Simcoe county (eye of human face made to form bowl).
122. Nottawasaga (fragment of pipe, human face with long ears).
241. Baptiste lake, Hastings county (square mouthed).

Copper Tools and Weapons.

1. Axe or chisel with socket, Manitoulin Island.
2. Axe—plain, Brantford.
4. Chisel, Beverly, Wentworth county.
6. Spear head, with tine, Brantford.
13. Bracelet, Rice Lake.
15. Spear head, London township.
16. Large spear, with socket, Burford township, Brant county.
18. Chisel or small axe, Noncon Island, Lake Scugog.
25. Spear with tine, Perth.
26. Knife (?) Baptiste Lake, Hastings county.
27. Spike or spear (12½ inches long) Kaministiquia River, at Fort William.
28. Axe or adze, Kaministiquia River, near Fort William.
29. Lake Moira, Hastings county.
27½. Spike or spear head, Port Rowan, Norfolk county.
28. Spike or chisel, London, Middlesex county.
29. Knife, St. Joseph's Island.
30. Curved cutting tool with undulated edge. Covered on one side with piece of beaver-skin—the remains of wrapping when placed in the grave, Midland City, Simcoe county.

Post-European.

1-61. Silver ornaments worn by the Indians. From graves in Brant county.
63. Silver hat-band, Brant county.
84. Pair of silver bracelets, Brant county.
85. Double-barred cross, Beausoleil Island, Georgian Bay.
91. Colored glass beads, Lake Medad, near Hamilton.
104. Blue glass beads, Beverly township.
105. Red glass beads, Beverly township.

METHODS OF WORKING.

Fig. 1 illustrates three of the methods employed in the manipulation of stone. A series of holes has been drilled along one side to detach the specimen from a larger portion, or to reduce it in size. Below these sawing has been resorted to, and other parts of the surface show marks of rubbing.

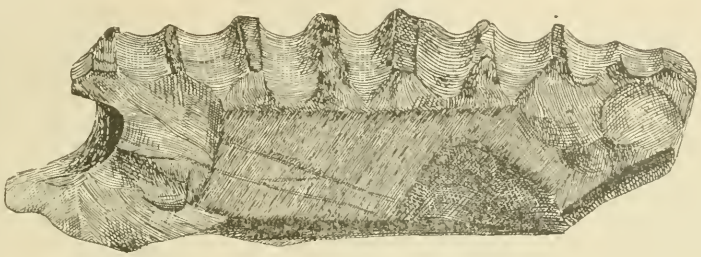

Fig. 1.

This excellent specimen forms part of a small but valuable collection presented to us by Mr. W. G. Wright, of Collingwood. Mr. Wright is an enthusiastic and intelligent student of Huron-Iroquois remains in the counties of Grey and Simcoe, and the Institute is deeply indebted to him for this and other gifts.

CLAY PIPES.

Fig. 2.

In the multiplicity of designs employed by the Indians in the manufacture of pipes, the human face occupies a prominent place. Fig. 2 is, on the whole, one of the neatest bits of clay work in the museum. It forms part of the admirable little collection presented by Mr. W. G. Wright, of Collingwood.

The pipe here figured is, in several respects, worthy of close examination. The clay is of fine quality, and light in color. Portions of the surface possess a fairly good glaze. The ears, both of which are broken, have been perforated.

It is almost needless to say that as this specimen is from near the shores of Nottawasaga Bay, it belonged to one of the Huron tribes, probably the Tobacco Nation.

Fig. 3 is of an unusual pattern. When perfect the end of the base, now fractured, was probably almost as long as the stem shown in the engraving. In general design it approaches to the platform or "monitor" type, a form seldom attempted in clay. Peculiar as this pipe is in many respects, it is the lower side of the base that attracts most attention, for here has been moulded a human face. The nose, mouth and one eye remain, and any lingering doubt is dispelled on

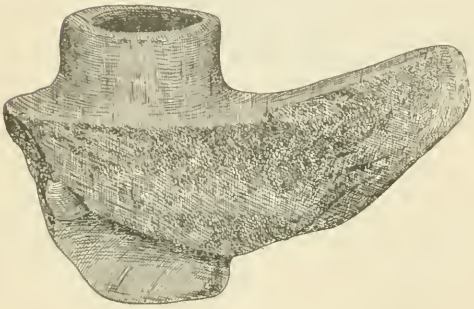

Fig. 3.

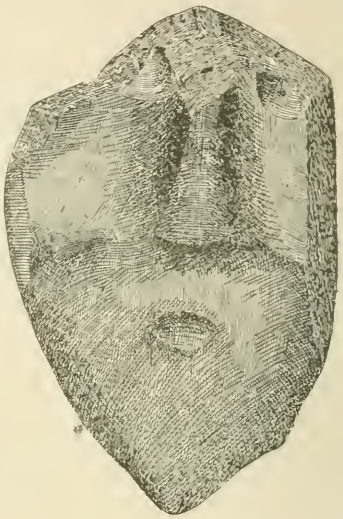

Fig. 4.

finding the nostrils distinctly marked. The imitation is a rude one, but nothing is more certain than that the pipe-maker intended to represent a face in this very unusual position. Fig. 4 illustrates the lower side of the base. This pipe is from Brant county, and is part of the collection procured from Chief A. G. Smith (De-ka-non-ra-neh), of the city of Brantford.

STONE PIPES.

Fig. 5.

The pipe figured here is of a pattern not uncommon among the Hurons. The ornamental portion was carved to face the smoker. The stem is broken off

close to the bowl. The material is a compact grey limestone, and portions of the bowl show traces of the working tools used in shaping it.

This pipe is also from the country of the Tobacco Nation, and was presented by Mr. W. G. Wright, of Collingwood.

Fig. 6.

The pipe represented by figure 6 is the only one in our collection in which the mouth of the face is made to serve as the stem-hole. The workmanship on this bowl is rude, unless we regard it as an unfinished specimen. It was found in the township of Nottawasaga by Mr. W. G. Wright, of Collingwood.

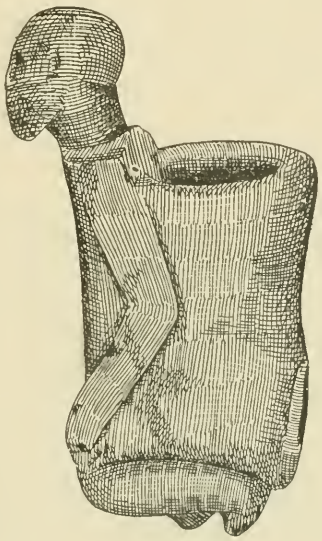

Fig. 7

The pipe of which Fig. 7 is a diagram is made of yellow soapstone. It appears to represent a man carrying a burden, which forms the bowl proper. The stem-hole enters from the front. This specimen shows signs of long use, as none of the outlines are at all sharp. The face markings are nearly all obliterated. Even when new it is not likely that Fig. 7 was a very fine piece of workman-

ship. It was found in the county of Brant, and in all probability belonged to the Attiwandarons or Neuters. It formed part of the collection of Chief Smith, Brantford.

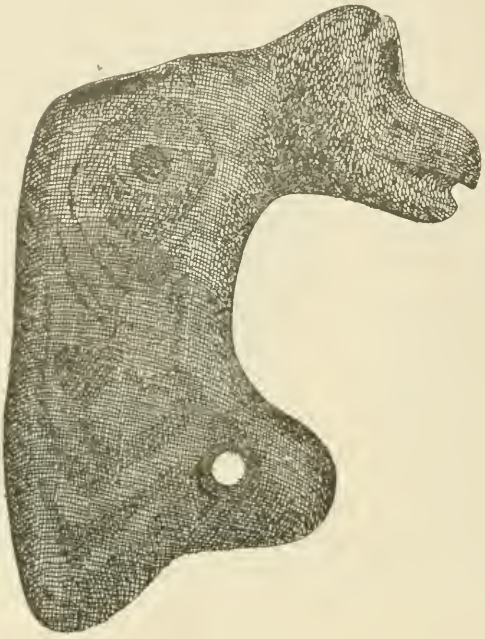

Fig. 8.

Not many stone pipes are formed from Huronian, or veined slate, as is the specimen figured above, which was presented by Mr. David Allan, of Rylston, in the county of Northumberland. It is not easy to recognise the animal-form the old mechanic intended to represent. The stem-hole enters from behind, and the hole shown in front no doubt served the double purpose of binding the bowl to the stem when in use, and of enabling the owner to attach it to his person when carrying it about.

Fig. 9.

Fig. 9 represents a very plain form of pipe, the bowl and stem being almost in line. It is made of dark gray soapstone, and was presented by Dr. T. W. Beeman, of Perth, Lanark county. In the evolution of stem and bowl from

one piece, specimens of this kind may be regarded as indicating one of the early stages, and yet the form may have depended wholly on the size and shape of the raw material. Fig. 9 is well formed, though simple in outline, and almost without any attempt at decoration.

Fig. 10.

Another soapstone pipe from the same locality, and presented by Dr. T. W. Beeman, is shown in Fig. 10. It is much larger than Fig. 9, and though less graceful in outline, possesses some markings round the lip of the bowl intended to enhance its appearance. The mouthpiece shows signs of many smokings.

GORGETS.

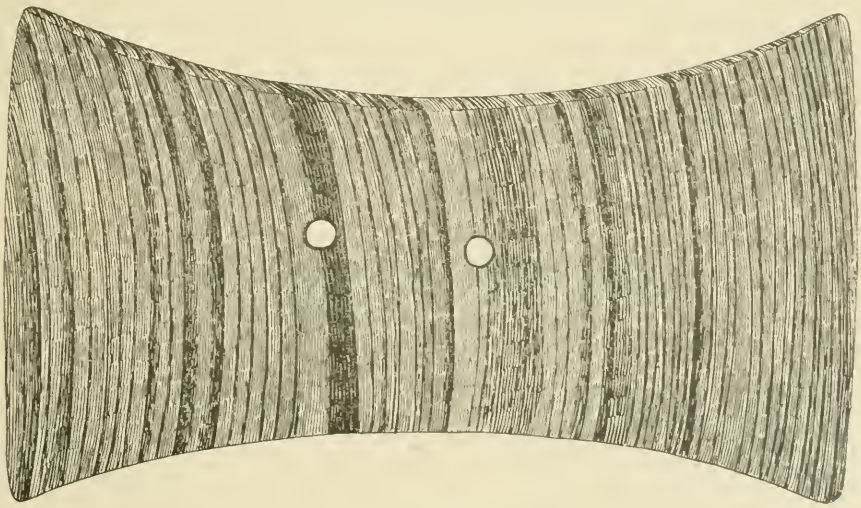

Fig. 11.

The gorget or tablet here figured is the most elegant and symmetrical in our collection, which comprises nearly two hundred of such objects. The material itself is an excellent specimen of the striped slate so much affected by the

Indians in producing this kind of article, whatever its purpose may have been. The piece, too, is remarkably thin—scarcely more than an eighth of an inch—and, in view of this, one is inclined to wonder at the perfect condition of the specimen.

We are indebted for this valuable tablet to Squire W. McDonnell, of Lindsay, Victoria county.

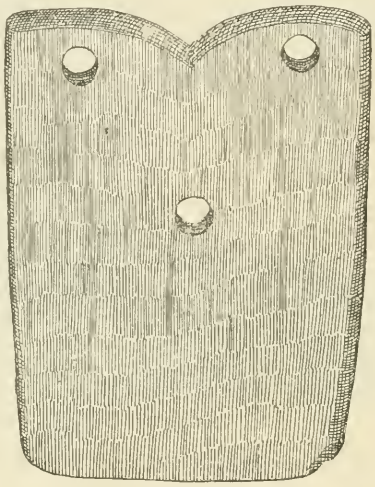

Fig. 12.

The handsome specimen here figured is from the collection procured by the Institute from Chief A. G. Smith, of Brantford. In point of perfection it is almost equal to the specimen illustrated by Fig. 11, and in at least one respect it is superior, viz., in the arrangement of the holes. Like Fig. 11 it is also unusually thin. It differs from most other objects of its class as to material, which in this case is a very fine-grained stone resembling in color and appearance German lithographic limestone.

BONE.

Fig. 13.

This specimen may have been a pin for fastening clothing, or a tool for marking pottery, or it may simply have been used as at ally-bone. It is acutely pointed at one end, and its edges are tolerably sharp. At what may be called the head are two series of notches which may have been intended either for ornament or as a record.

The specimen was found in Brant county and is part of the Smith collection.

COPPER.

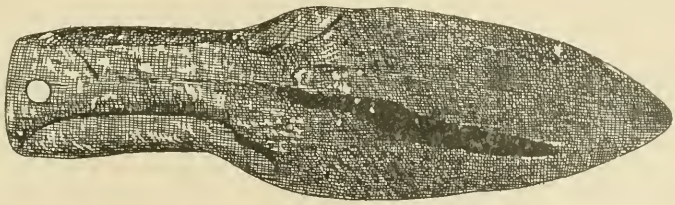

Fig. 14.

Fig. 14 represents a spearhead of copper found in Lanark county, and presented by Dr. T. W. Beeman. It is provided with a socket. The blade is thin and flat on both sides. It is peculiar in having a hole at the head of the socket as if to aid in fastening the handle. This hole may be of recent origin.

Fig. 15.

In Fig. 15 we have what represents a very fine specimen of native copper weapon. Like the specimen shown at Fig. 14 it is provided with a socket which is neatly formed. The side of the blade shown is flat, the opposite side is ridged as shown in cross section in the diagram. This specimen also was presented by Dr. T. W. Beeman.

THE SOUTHWOLD EARTHWORK AND THE COUNTRY OF THE NEUTRALS.

By James H. Coyne, B.A.

That part of the township of Southwold lying between Talbot Creek and the most westerly bend of Kettle Creek included several Indian earthworks, which were well known to the pioneers of the Talbot settlement. What the tooth of time had spared for more than two centuries yielded, however, to the settler's plow and harrow, and but one or two of these interesting reminders of an almost-forgotten race remain to gratify the curiosity of the archæologist or of the historian. Fortunately, the most important of all is still almost in its original condition. It is that which has become known to the readers of the transactions of the Canadian Institute as the Southwold Earthwork. Mr. David Boyle, in the Archæological Reports printed in 1891, has given the results of his examinations of the mounds, and there is now in the possession of the Institute a carefully prepared plan made from actual survey by Mr. A. W. Campbell, C.E., for the Elgin Historical and Scientific Institute of St. Thomas, and presented by the latter to the Canadian Institute. Mr. Boyle's reports and Mr. Campbell's plan will together form a valuable, and, it is hoped, a permanent record of this interesting memorial of the aboriginal inhabitants of south-western Ontario.

The writer of this paper has been acquainted with "the old fort," as it was called, since the year 1867. At that time it was in the midst of the forest. Since then the woods have been cleared away, except within the fort and north of it. Indeed, a considerable number of trees have been felled within the southern part of the enclosure. In the mounds themselves trees are abundant, and there are many in the moat or ditch between. The stumps of those which have been cut down are so many chronological facts, from which the age of the fort may be conjectured with some approach to accuracy. A maple within the enclosure exhibits 242 rings of annual growth. It was probably the oldest tree within the walls. A maple in the outer embankment shows 197 rings; between the inner and outer walls a beech stump shows 219 rings, and an elm 266. Judging from the size of these stumps, it would be safe to calculate the age of the forest at about 200 years, with here and there a tree a little older. The area enclosed is level. In the field south there are numerous hummocks formed by the decayed stumps and roots of fallen trees. The walls were manifestly thrown up from the outside. There is an exception on the south-east. Here the ground outside was higher, and to get the requisite elevation the earth was thrown up on both walls from the intervening space, as well as on the exterior wall from the outside. Each of the walls runs completely round the enclosure, except where the steep bank of the little stream was utilized to eke out the inner wall for five or six rods on the west side, as shown on the plan. Opposite the south end of this gap was the original entrance through the outer wall. The walls have been cut through in one or two other places, doubtless by settlers hauling timber across them.

The writer accompanied Mr. Campbell on his visits in the spring and fall of 1891. The members of the Elgin H. and S. Institute made a pretty thorough examination of a large ash-heap south-east of the fort. It had, however, been frequently dug into during the last score or two of years, with ample results, it is said, in the way of stone implements of various kinds. There still remained, however, arrow-heads and chippings of flint, stones partially disintegrated from the action of heat, fragments of pottery whose markings showed a very low stage of artistic development; fish-scales, charred maize and bones of small animals

the remains of aboriginal banquets. Within the enclosure, corn-cobs were found by digging down through the mould, and a good specimen of a bone needle, well smoothed but without any decoration, was turned up in the bed of the little stream where it passes through the fort.

The original occupants were manifestly hunters, fishermen and agriculturists, as well as warriors. Nothing appears to have been found in the neighborhood pointing to any intercourse between them and any European race.

It would seem that the earthwork was constructed in the midst of a large clearing, and that the forest grew up after the disappearance of the occupants. A few saplings, however, may have been permitted to spring up during their occupancy for the sake of the shelter they might afford. These are represented by the oldest stumps above mentioned.

The question, who were the builders, is an interesting one. To answer it, we need not go back to a remoter period than the middle of the 17th century, when the Iroquois, after destroying the Huron settlements, turned their attention to the southward, and the Neutral nation ceased to exist. However long before that time it may have been built, the enclosure was, we may reasonably believe, a fortified village of the Neutrals up to their evacuation of this Province nearly a quarter of a millennium ago.

Substantially all that is known of the Neutrals, is to be found in Champlain's works, Sagard's history, the Relations and Journal of the Jesuits, and Sanson's map of 1656. A digest of the information contained therein is given in the following pages. The writer has availed himself of one or two other works for some of the facts mentioned. Mr. Benjamin Sulte's interesting and learned articles on "Le pays des grands lacs au XVII^E Siècle" in that excellent magazine, "Le Canada Français," have been most valuable in this connection.

The first recorded visit to the Neutrals was in the winter of 1626, by a Recollet father, De Laroche-Daillon. His experiences are narrated by himself, and Sagard, who includes the narrative in his history, supplements it with one or two additional facts. In company with the Jesuit Fathers, Brebeuf and de Noue, Daillon left Quebec with the purpose of visiting the Hurons, who were settled in villages between the Georgian Bay and Lake Simcoe, and of laboring for their conversion. After the usual hardships, journeying by canoe and portage, by way of the Ottawa and French Rivers, they arrived at their destination. The ill-fated Brûlé told wonderful stories of a nation, whom the French called the Neutrals, and Father Joseph Le Caron wrote Daillon urging him to continue his journey as far as their country.

He set out accordingly on the 18th October, 1626, with two other Frenchmen, Grenolle and la Vallée. Passing through the territory occupied by the Tobacco nation, he met one of their chiefs, who not merely offered his services as guide, but furnished Indian porters to carry the packs and their scanty provisions. They slept five nights in the woods, and on the sixth day arrived at the first village of the Neutrals. In this as well as in four other villages which they visited, they were hospitably entertained with presents of food, including venison, pumpkins, "neintahouy," and "the best they had." Their dress astonished their Indian hosts, who were also surprised that the missionary asked nothing from them but that they should raise their eyes to heaven, and make the sign of the cross.

What excited raptures of admiration, however according to his narrative, was to see him retire for prayer at certain hours of the day, for they had never seen any religious, except amongst the neighboring Hurons and Tobacco Indians.

At the sixth village, Ounontisaston, in which Daillon had been advised to to take up his abode, a council was held at his instance. He observes that the

councils are called at the will of the chiefs, and held either in a wigwam or in the open air, the audience being seated on the ground; that silence is preserved whilst a chief is addressing the assembly, and that they are inviolable observers of what they have once concluded and settled.

Daillon explained that he had come on the part of the French to make alliance and friendship with them and to invite them to come and trade, and begged them to permit him to stay in their country "to instruct them in the laws of our God, which is the only means of going to paradise." They agreed to all he proposed, and in return for his gifts of knives and other trifles, they adopted him as "citizen and child of the country," and as a mark of great affection entrusted him to the care of Souharissen, who became his father and host. The latter was, according to Daillon, the chief of the greatest credit and authority that had ever been in all the nations, being not only chief of his village, but of all those of his nation, to the number of twenty-eight, besides several little hamlets of seven to eight cabins built in different places convenient for fishing, hunting or cultivating the ground.

Souharissen had acquired so absolute an authority by his courage and his success in war. He had been several times at war with the seventeen tribes who were their enemies, and from all he had brought back heads of those he had slain, or prisoners taken alive. His authority was without example amongst other tribes.

The Neutrals are reported by Daillon as being very warlike, armed only with war-club and bow, and dexterous in their use. His companions having gone back, the missionary remained alone, "the happiest man in the world," seeking to advance the glory of God, and to find the mouth of the river of the Iroquois,* in order to conduct the savages to the French trading posts. He visited them in their huts, found them very manageable, learned their customs, remarked that there were no deformed people amongst them, and taught the children, who were sprightly, naked and unkempt, to make the sign of the Holy Cross.

The natives were willing that at least four canoes should go to trade if he would conduct them, but nobody knew the way.

Yrcquet, an Indian known in the country, who had come beaver-hunting with twenty of his tribe, and taken 500, declined to give him any indication of the mouth of the river, but he agreed with several Hurons in assuring Daillon that a journey of ten days would take him to the trading post. The missionary, however, was afraid of taking one river for another and getting lost or perishing of hunger.

For three months he was treated with kindness Then the Hurons became jealous lest the trade should be diverted from them. They accordingly circulated rumors through every village, that Daillon was a great magician, that he had poisoned the air in their country, and many had died in consequence, that if he was not soon killed, he would burn up their villages and kill their children, with other stories as extraordinary about the whole French nation. The Neutrals were influenced by the reports. Daillon's life was in danger on more than one occasion. The rumor reached Brebeuf and de Noue, that he had been killed. They at once despatched Grenolle to ascertain the truth, with instructions to bring Daillon back if alive. He acquiesced, and returned to the Huron country.

He speaks of a Neutral village, called Ouaroronon one day's journey from the Iroquois, the people of which came to trade at Ounontisaston. Their village was the last of the Neutral villages.

* Note.—This was doubtless the Niagara.

Dailon, like every other traveler, was charmed with the Neutral country, which he pronounces incomparably greater, more beautiful and better than any other "of all these countries." He notes the incredible number of deer, the native mode of taking them by driving them into an enclosure, and their practice of killing every animal they find, whether they needed it or not. The reason alleged was that if they did not kill all, the beasts that escaped would tell the others how they had been chased, so that afterwards when the Indians needed game they would not be able to get near it. He enumerates moose, beaver, wild cats, black squirrels, larger than squirrels in France, bustards, turkeys, cranes, etc., as abundant, and remaining in winter. The winter was shorter and milder than "in Canada." No snows had fallen by the 22nd November. The deepest was not more than two and a half feet. Thaws set in on the 26th January. On the 8th March the snow was gone from the open places, but a little still lingered in the woods. The streams abounded in very good fish. The ground produced more corn than was needed, besides pumpkins, beans and other vegetables in abundance, and excellent oil. He expresses his surprise that the Merchants' Company had not sent some Frenchman to winter in the country, for it would be very easy to get the Neutrals to trade, and the direct route would be much shorter than that by way of French River and the Georgian Bay. He speaks of the Neutrals' country as being nearer than the Huron to the French, and as being on one side of the lake of the Iroquois (Lake Ontario), whilst the Iroquois were on the other. The Neutrals, however, did not understand the management of canoes, especially in the rapids, of which there were only two, but long and dangerous. Their proper trade was hunting and war; they were lazy and immoral; their manners and customs were very much the same as the Hurons; their language was different, but the members of the two nations understood one another; they went entirely unclad.

Sagard adds that "according to the opinion of some" the Neutrals' country was eighty leagues in extent, and that they raised very good tobacco which they traded with their neighbors. They were called Neutrals on account of their neutrality between the Hurons and the Iroquois; but they were allies of the Cheveux Relevés against their mortal enemies of the Nation of Fire. Sagard was dissuaded by some members of the French trading company from attempting to bring about a peace between the Hurons and the Iroquois. It was supposed that this would divert the trade of the Hurons from Quebec through the Iroquois country to the Dutch of the Hudson River. At so early a date did the question of trade relations between the territories north and south of the lakes agitate the minds of statesmen and men of commerce.

In the winter of 1640-1, the Jesuit missionaries, Brebeuf and Chaumonot, traversed the country of the Neutrals. The former composed a dictionary showing the differences between the kindred dialects of the Hurons and Neutrals. Chaumonot made a map of the country, which is not extant; but it was no doubt the authority for the delineation of the territory on Sanson's map of 1656, and Ducreux's Latin map of 1660. It is highly probable that they reached the Detroit River, and that they visited and named the Neutral village, of which the Southwold earthwork is the memorial. The reasons for thinking so will appear in the course of this paper.

What is probably the first printed map in which Lake Erie is shown was made by N. Sanson d'Abbeville, Geographer in Ordinary to the King, and printed in Paris, with "privilège du Roy" for 20 years, in the year 1656. It is a map of the northern part of America. The sources of information are stated in general terms, which may be translated as follows: "The most northerly portion is "drawn from the various Relations of the English, Danes, etc. Towards the

"south the coasts of Virginia, New Sweden, New Netherlands and New England "are drawn from those of the English, Dutch, etc. THE GREAT RIVER OF "CANADA, or of St. Lawrence, and all the neighboring regions (*environs*) are "according to the Relations of the French."

Now, we know that Father Raymbault visited Sault Ste. Marie in 1641 and mapped Lake Superior, and that Father Chaumonot in the same year rendered the same service for the Neutral country. Sanson's map is fairly accurate for the upper lakes, when compared with some maps published at a much later period when the lakes had become well known to traders and travelers. It shows an acquaintance with the general contour of Lakes Erie, St. Clair and Huron, with several of the streams emptying into Lake Erie and Lake Huron on both the Canadian and the American sides, with the names of tribes inhabiting both shores, and with the locations of five towns of the Neutrals, besides some towns of the Tobacco nation. The Neutral towns are given as S. François (N.E. of Sarnia), S. Michel (a little east of Sandwich), S. Joseph (apparently in the County of Kent), Alexis (a few miles west of a stream which flows into Lake Erie about midway between the Detroit and Niagara Rivers, and where the shore bends farthest inland), and N. D. des Anges (on the west bank of a considerable river, probably the Grand River, near where Brantford now stands*). The Detroit and Niagara Rivers, and four streams flowing into Lake Erie between them, are shown but not named. The great cataract is called "Ongiara Sault." The name "Ongiara" may, however, be that of a Neutral village east of the Falls. Lake St. Clair is called "Lac des Eaux de Mer," or Sea-water Lake, possibly from the mineral springs in the neighborhood. The country of the Tobacco Nation includes the Bruce peninsula, and extends from the Huron country on the east to Lake Huron on the west and Burlington Bay on the south-east. The Neutral country (Neutre ou Attiouandarons) would embrace the whole of south-western Ontario south of a line drawn from the west end of Lake Ontario to a stream which flows into Lake Huron about midway between Point Edward and Cape Hurd, and which is probably the Maitland River. The tribes to the south of the lakes are indicated from the Niagara River to Lake Superior. The Eries or "Eriechronons, on du Chat," are south-east of Lake Erie; the "Ontarraronon" are west of what is probably the Cuyahoga River; at the south-west of the Lake appear the "Squenqioronon;" west of the Detroit River are the "Aictaeronon;" west of Port Huron the "Couarronon;" Huron county in Michigan is occupied by the "Ariaetoeronon;" at the head of Saginaw Bay and extending southward through Michigan are the "Assistaéronons ou du Fen;" in the peninsula extending north to Mackinac are the "Oukouarararonons;' beyond them Lake Michigan appears as "Lac de Puans;" then comes the Mackinac peninsula and "Lac Supérieur." Manitoulin Island is marked "Cheveux Relevés," the old French name for the Ottawas. The Tobacco Nation, called "N. du Petun on Sanhionontateheronons," includes villages of "S. Simon et St Iude" in the Bruce promontory, "S. Pierre" near the south end of the County of Bruce, and "S. Pol" south-west of a lake which might be Scugog.

The Narratives agree in stating that the Neutrals, like their kinsmen of the Huron, Tobacco and Iroquois nations, were a numerous and sedentary race, living in villages and cultivating their fields of maize, tobacco and pumpkins. They were on friendly terms with the eastern and northern tribes, but at enmity with those of the west, especially the Nation of Fire, against whom they were constantly sending out war parties. By the western tribes it would appear that those west of the Detroit River and Lake Huron are invariably meant.

* Alexis corresponds with the actual situation of the Southwold earthwork.

Champlain refers to the Neutrals in 1616 as a powerful nation, holding a large extent of country and numbering 4,000 warriors, and to their alliance with the Cheveux Relevés (the Ottawas), whom he visited in the Bruce peninsula, against the Nation of Fire. He states that the Neutrals lived two days to the south of the Cheveux Relevés, and the Nation of Fire ten days from the latter. The Nation of Fire occupied part of what is now Michigan, and it is quite probable that they extended as far east as the Detroit and St. Clair Rivers.

Describing his visit to the Cheveux Relevés, he adds: "I had a great desire "to go and see that nation (the Neutrals), had not the peoples where we were "dissuaded me from it, saying that the year before one of ours had killed one of "them, being at war with the 'Entouhoronons' (the Senecas) and that they were "angry on account of it, representing to us that they are very subject to ven- "geance, not looking to those who dealt the blow but the first whom they meet "of the nation, or even their friends, they make them bear the penalty when "they can catch any of them, unless beforehand peace had been made with them "and one had given them some gifts and presents for the relatives of the "deceased, which prevented me for the time from going there, although some of "that nation assured us that they would do us no harm for that. This decided "us, and occasioned our returning by the same road as we had come, and con- "tinuing my journey I found the nation of the Pisierinij," etc.*

Brebeuf, who reckons the Hurons at more than 30,000, describes the Neutrals in 1634 as much more numerous than the former. The Relation of 1641 gives them at least 12,000, but adds that notwithstanding the wars, famine and disease (small-pox) which since three years had prevailed in an extraordinary degree, the country could still furnish 4,000 warriors, the exact number estimated by Champlain a quarter of a century earlier. The name of the Neutrals is variously given as "Attikadaron," "Atiouandaronk," "Attiouandaron," "Attiwandaronk," but the last is the more common. The name signified "people who spoke a slightly different dialect," and was equally applied to the Hurons by the Neutrals. The Neutrals are mentioned in the Relations as one of the twelve numerous and sedentary nations who spoke a common language with the Hurons. The "Oueanohronons" formed "one of the nations associated with the Neutral nation." They are afterwards called in the same Relation (1639) the "Wenrôhronons," and are said to have lived on the borders of the Iroquois, more than 80 leagues from the Huron country. So long as they were on friendly terms with the Neutrals they were safe from the dreaded Iroquois, but a misunderstanding having arisen between them, they were obliged to flee in order to avoid extermination by the latter. They took refuge (more than 600 in all) with the Hurons, and were received in the most friendly and hospitable manner.

The Relation of 1640 speaks of a Huron map communicated by Father Paul Ragueneau, in which a large number of nations, most of them acquainted with the Huron language, are shown, including the Iroquois, the Neutrals, the Eries, etc. The "Mission of the Apostles" was established among the Tobacco Nation by Garnier and Jogues, in 1640. Nine villages visited by them were endowed by the missionaries with the names of apostles, two of which are given in Sanson's map of 1656.† In one "bourg," called S. Thomas, they baptised a boy five years old, belonging to the Neutral nation, who died immediately afterwards.

* Note.—The above translation is verbatim and exhibits the author's peculiarities of style. The Pisierinij are of course the Nipissings.

† The principal "bourg" was Ehwae, surnamed S. Pierre et S. Paul. If S. Pierre on Sanson's map is the same place, this must have been near the south end of the County of Bruce. The other village or mission shown on the map is S. Simon et S. Iude.

"He saw himself straightway out of banishment and happy in his own country." The famine had driven his parents to the village of the Tobacco Nation. The devoted missionaries add, that this was the first fruits of the Neutral Nation.

In the fall of the same year "the Mission of the Angels" was begun among the Neutrals. The lot fell upon Jean de Brebeuf and Joseph Marie Chaumonot. The former was the pioneer of the Jesuit Mission. He had spent 3 years among the Hurons, from 1626 to 1629, and, after the restoration of Canada to France by Charles I, he had returned, in 1634, to the scene of his earlier labors. His associate had only come from France the year before. Brebeuf was distinguished for hismastery of the native tongues, and Chaumonot had been recognized as an apt student of languages. The plan of the Jesuits was to establish in the new mission a fixed and permanent residence, which should be the "retreat" of the missionaries of the surrounding country, as Ste. Marie was of those of the Huron mission.

Lalemant, from their report, describes the Neutral nation as exceedingly populous, including about 40 villages (*bourgous bourgades*). The nearest villages were 4 or 5 days' journey, or about 40 leagues distant from the Hurons, going due south. He estimates the difference in latitude, between Ste. Marie and the nearest village of the Neutrals to the south, at about 1°55′. Elsewhere the distance is spoken off as about 30 leagues.

From the first "bourg," going on to the south or south-west, (a mistake, for south-east it would seem), it was about four days' journey to the mouth of the Niagara River. On *this* side of the river and not beyond it, as "some map" lays it down, (Champlain's, doubtless,) were most of the "bourgs" of the Neutral nation. There were three or four on the other side, towards the Eries. Lalemant claims, and there is no doubt as to the fact, that the French were the first Europeans to become acquainted with the Neutrals. The Hurons and Iroquois were sworn enemies to each other, but in a wigwam, or even a camp of the Neutrals, until recently, each had been safe from the other's vengeance. Latterly, however, the unbridled fury of the hostile nations had not respected even the neutral ground of their mutual friends. Friendly as they were to the Hurons and Iroquois, the Neutrals engaged in cruel wars with other nations to the west, particularly the nation of Fire, as has been stated above. The previous year a hundred prisoners had been taken from the latter tribe. This year, returning with 2,000 warriors, the Neutrals had carried off more than 170. Fiercer than the Hurons, they burned their female prisoners. Their clothing and mode of living differed but little from those of the Hurons. They had Indian corn, beans and pumpkins in equal abundance. Fish were abundant, different species being met with in different places. The country was a famous hunting ground. Deer, elk, (or whatever were meant by "*vaches*"), wild cats, wolves, "black beasts," (squirrels), beaver and other animals, valuable for their skins and flesh, were in abundance. It was a rare thing to see more than half a foot of snow. This year there was more than three feet. The deep snow had facilitated the hunting, and, in happy contrast with the famine which had prevailed, meat was plentiful. They had also multitudes of wild turkeys, which went in flocks through the fields and woods. Fruits were no more plentiful than among the Hurons, except that chestnuts abounded, and wild apples were a little larger.

Their manners and customs, and family and political government were very much like those of the other Indian tribes, but they were distinguished from the Hurons by their greater dissoluteness and indecency. On the other hand, they were taller, stronger, and better formed.

Their burial customs were peculiar, although similar customs are reported at this day amongst some African tribes. The bodies remained in their wigwams

until decomposition rendered them insupportable, when they were put outside on a scaffold. As soon as possible, the bones were removed and arranged within their wigwams on both sides, in sight of the inmates, where they remained until the Feast of the Dead.

Having these mournful objects before their eyes, the women habitually indulged in cries and laments, in a kind of chant.

The Neutrals were distinguished for the multitude and quality of their madmen, who were a privileged class amongst them. The immunities they enjoyed were frequently the cause of shrewd, bad, Indians assuming the character of maniacs, in order to perpetrate crimes without fear of punishment. The Jesuits suffered much at their hands.

Some old men told them that the Neutrals used to carry on war "towards" a certain western nation, who would seem to have lived on the Gulf of Mexico, where the "porcelain, which are the pearls of the country," was obtained from a kind of oysters. They also obtained some vague notions of alligators, which are, apparently, referred to by the description "certain aquatic animals, larger and swifter than the elk," against which these some people had "a kind of war," the details of which are somewhat amusing, as given by Lalemant.

The two Jesuits left Ste. Marie the 2nd November, 1640, with two French servants (probably "donnés") and an Indian. They slept 4 nights in the woods. The 5th day they arrived at the first "bourg" of the Neutral Nation, called Kandoucho, but to which they gave the name of All Saints. This is probably the same as N. D. des Anges, on Sanson's map, and not far, perhaps, from the site of Brantford.

Owing to the unfavorable reports which had been spread through the country about the Jesuits, the latter were anxious to explain their purposes to an assembly of the chiefs and old men. The head chief, "who managed the affairs of the public," was called Tsohahissen, (doubtless the same as Daillon's Souharissen). His "bourg" was "in the middle of the country"; to reach it, one had to pass through several other "bourgs et bourgades." In Sanson's map, Alexis is placed almost exactly "in the middle of the country" of the Neutrals. No other village is marked on the map to which the expression could be applied. Its situation nearly midway between the Detroit and Niagara rivers, a few miles west of a stream which flows into Lake Erie, just where the mouth of Kettle creek would appear in a map of our own century, corresponds with that of the Southwold earthwork. Was the latter the Neutrals' capital? We can only conjecture; but the evidence of the Relations, the map and the forest growth, all points strongly to an affirmative answer to the question. There is a strong probability that it was here Tsohahissen reigned (if the expression is allowable, as referring to an Indian potentate) as head chief of the forty Neutral villages. Through the western gate, doubtless, his warriors set out to wage their relentless warfare against the nation of Fire, and, when satiated with blood, came back in triumph, adorned with the scalps of their enemies.

Brebeuf's Huron surname, "Echon," had preceded him. He was regarded as "one of the most famous sorcerers and demons ever imagined." Several Frenchmen had travelled through the country before him, purchasing furs and other commodities. These had smoothed the way for the Jesuits. Under the pretext of being traders, Brebeuf's party succeeded in making their way, in spite of all obstacles interposed. They arrived at the head chief's village, only to find that he had gone on a war party and would not return until spring. The missionaries sought to negotiate with those who administered affairs in his absence. They desired to publish the Gospel throughout these lands, "and thereby to contract a particular alliance with them." In proof of their desire, they had brought a neck-

lace of two thousand grains of "porcelain," which they wished to present to "the public." The inferior chiefs refused to bind themselves in any way by accepting the presents, but gave the missionaries leave, if they would wait until the chief of the country returned, to travel freely and give such instruction as they pleased. Nothing could have suited the fathers better. First, however, they decided to return in their steps and reconduct their domestics out of the country, and then resume their journey for the second time, and "begin their function." As it had been the servants, however, who had assumed the rôle of traders, and this pretext was now wanting to the Jesuits, they suffered everywhere from the malicious reports which had been circulated as to their purposes in visiting the nation, and the acts of sorcery with which they were charged. The Hurons of the Georgian Bay, alarmed for the monopoly they had hitherto enjoyed, and jealous of the French traders, had sent emissaries amongst the Neutrals to poison their minds against the adventurous travelers by the most extraordinary calumnies. For these reports two Huron Indians, Aouenhokoui and Oëntara were especially responsible. They had visited several villages, presented hatchets in the name of the Huron chiefs and old men, and denounced their visitors as sorcerers, who desired to destroy the Neutrals by means of presents. These representations were so effectual that a council was held by the chiefs and the present was formally refused, although permission to preach was granted.

From village to village they passed, but everywhere the doors were barred to them. Hostile looks greeted them wherever they went. No sooner did they approach a village than the cry resounded on all sides "Here come the Agwa." This was the name given by the natives to their greatest enemies. If any received the priests into their dwellings, it was more frequently from fear that the sorcerers would revenge the refusal, than from the hope of gain, "God making use of everything in order to nourish his servants."

In the graphic language of Lalemant: "The mere sight of the fathers, in figure and habit so different from their own, their gait, their gestures and their whole deportment, seemed to them so many confirmations of what had been told them. The breviaries, ink-stands and writings were judged by them instruments of magic; if the Frenchmen prayed to God, it was precisely according to their idea an exercise of sorcerers. Going to the stream to wash their dishes, it was said they were poisoning the water; it was charged that through all the wigwams, wherever they passed, the children were seized with a cough and blood flux, and the women became barren. In short, there was no calamity, present or to come, of which they were not considered as the source. Several of those with whom the fathers were lodged did not sleep day or night on account of it; they dared not touch what had been handled by them; they returned their presents, regarding everything as suspicious. The good old women already regarded themselves as lost, and only regretted their little children, who might otherwise have been able to re-people the earth."

The Neutrals intimidated the fathers with accounts of the Senecas, who they were assured were not far off. They spoke of killing and eating the missionaries. Yet in the four months of their sojourn Brebeuf and Chaumonot never lacked the necessaries of life, lodging and food, and amidst difficulties and inconveniences better imagined than described, they retained their health. Their provision of food was bread, baked under ashes, after the fashion of the country, and which they kept for thirty and forty days to use in case of need.

"In their journey the fathers passed through eighteen '*bourgs ou bourgades*,' "to all of which they gave a Christian name, of which we shall make use here-"after on occasion. They stayed particularly in ten, to which they gave as much

"instruction as they could find hearers. They report about 500 fires and 3,000 "persons, which these ten *bourgades* may contain, to whom they set forth and "published the Gospel, but it is very difficult for the sound of it to have rung "through the whole country. We reckon, however, only these 3,000 in our "calculation."

In another place it is stated that there were 40 villages of the Neutrals in all.

Disheartened, the fathers decided to return to Kandoucho, or All Saints, to await the spring. Midway, however, at the village of "Teotongniaton," or S. Guillaume (perhaps in the vicinity of Woodstock), the snow fell in such quantities as to be impassable. They lodged here in the cabin of a squaw, who entertained them most hospitably, and instructed them in the language, dictating narratives syllable by syllable as to a schoolboy. Here they stayed twenty-five days, "adjusted the dictionary and rules of the Huron language to that of these "tribes (the Neutrals), and accomplished a work which alone was worth a journey "of several years in the country."

Hurons from the Mission of La Conception volunteered to go to the relief of the daring travelers. After eight days of travel and fatigue in the woods the priests and the relief party arrived at Ste. Marie on the very day of St. Joseph, patron of the country, in time to say Mass, which they had not been able to say since their departure.

Amongst all the eighteen villages visited by them only one (that of "Khioetoa," called by the fathers Sainct Michel) gave them the audience their embassy merited. In this village, years before, driven by fear of their enemies, had taken refuge a certain foreign nation, "which lived beyond Erie or the Cat "Nation," named "Aouenrehronon." It was in this nation that the fathers performed the first baptism of adults. These were probably a portion of the kindred Neutral tribe, the Wenrôhronons, referred to above as having fled to the Huron country from the Iroquois.*

Sanson's map shows S. Michel a little east of where Sandwich now stands.

Owing to their scanty number and the calumnies circulated amongst the Indians respecting the Jesuits of the Huron Mission, the latter resolved to concentrate their forces. The Neutral mission was abandoned, but Christian Indians visited the Neutrals in 1643, and spread the faith amongst them with a success which elicits Lalemant's enthusiastic praises. Towards the end of the following winter a band of about 500 Neutrals visited the Hurons. The fathers did not fail to avail themselves of their opportunity. The visitors were instructed in the faith, and expressed their regret that their teachers could not return with them. A different reception from that experienced by Brebeuf and Chaumonot three years before was promised.

Lalemant relates that, in the summer of 1643, 2,000 Neutrals invaded the country of the Nation of Fire and attacked a village strongly fortified with a palissade and defended stoutly by 900 warriors. After a ten days' siege they carried it by storm, killed a large number on the spot, and carried off 800 captives, men, women and children, after burning 70 of the most warlike and blinding the eyes and "girdling the mouths" of the old men, whom they left to drag out a miserable existence. He reports the Nation of Fire as more populous than the Neutrals, the Hurons and the Iroquois all together. In a large number of their villages the Algonkin language was spoken. Farther away it was the prevailing tongue. In remote Algonkin tribes at that early day there were Christians who knelt, crossed their hands, turned their eyes Heavenward, and prayed to God

* Note.—Compare also the name of the village referred to by Sagard, "Ouaroronon."

morning and evening and before and after their meals, and the best mark of their faith was that they were no longer wicked nor dishonest as they were before. So it was reported to Lalemant by trustworthy Hurons, who went every year to trade with Algonkin nations scattered here and there in the far west.

Ragueneau, in the Relation of 1648, refers to Lake Erie as being almost 200 leagues in circuit, and precipitating itself by "a waterfall of a terrible height" into Lake Ontario or Lake St. Louys.

The "Aondironnons," a tribe of the Neutrals living nearest to the Hurons, were treacherously attacked in their village by 300 Senecas, who, after killing a number of them, carried as many as possible away with them as prisoners. The Neutrals showed no open resentment, but quietly prepared to revenge themselves.

A Christian Huron, a girl of 15, taken prisoner by the Senecas, escaped from them and made her way to the Neutral country, where she met four men, two of whom were Neutrals and the others enemies. The latter wished to take her back to captivity, but the Neutrals, claiming that within their country she was no longer in the power of her enemies, rescued her, and she returned in safety to Ste. Marie.

These incidents were the prelude to the storm which shortly afterwards burst. In 1650 the principal part of the Iroquois forces was diverted against the Neutrals. They carried two frontier villages, in one of which were more than 1,600 men—the first at the end of the autumn, the second early in the spring of 1651. The old men and children, who might encumber them on their homeward journey, were massacred. The number of captives was excessive, especially of young women, who were carried off to the Iroquois towns. The other villages more remote were seized with terror. They abandoned their houses, their property and their country. Famine pursued them. Scattered amongst distant woods, lakes and rivers they lived in wretchedness and want, and in constant apprehension of their relentless enemy.

The Journal (April 22, 1651) adds that after the destruction of the Neutral village the* previous autumn the Neutral warriors, under the lead of the Tahontaenrat, had followed the assailants and killed or taken 200 of them, and 1,200 Iroquois warriors had returned in the spring to avenge this disaster. In August a Huron reported at Montreal the capture of Te ot 'ondiaton (probably the village in which Brebeuf composed his dictionary, and which is referred to in the Relation as having been taken in the spring). The condition of the Neutrals was desolate and desperate. In April, 1652, news reached Quebec that the Neutrals had leagued with the Andastes against the Iroquois, that the Senecas had been defeated in a foray against the Neutrals, so that the Seneca women had been constrained to quit their village and retreat to the Oneida country; and also that the Mohawks had gone on the war path against the Andastes during the winter, and the issue of the war was unknown. The last of July, 1653, seven Indians from the Huron country arrived at Quebec and reported a great gathering near Mackinac of all the Algonkin nations, with the remains of the Tobacco and Neutral nations at A'otonatendié, three days above the Sault Ste. Marie (Skia'é) towards the south. The Tobacco Indians had wintered at Tea'onto'raï, the Neutrals to the number of 800 at Sken'chio'e towards Te'o'chanontian. These were to rendezvous the next fall with the Algonkins, who were already on the spot to the number of 1,000.

This is probably the last we hear of the Neutrals under their own name.†

* Hurons from Georgian Bay.

† Some of the survivors united with the remnant of the Hurons at Makinac and on Lake Superior, and under the name of the Hurons or Wyandots they appear from time to time on the page of history. Their removal to Detroit, on the establishment of the latter trading place by Cadaillac, is perpetuated by the name of Wyandotte, to the south of the City of the Straits.

Parkman mentions the circumstance that an old chief named Kenjockety, who claimed descent from an adopted prisoner of the Neutral nation, was recently living among the Senecas of Western New York.

It is stated in the "History of the County of Middlesex" that over sixty years ago "Edouard Petit, of Black River, discovered the ruins of an ancient building on the Rivière aux Sables, about forty miles from Sarnia. Pacing the size he found it to have been 40 x 24 ft. on the ground. On the middle of the south or gable end was a chimney 18 ft. high in excellent preservation, built of stone, with an open fireplace. The fireplace had sunk below the surface. This ruin had a garden surrounding it, ten or twelve rods wide by twenty rods in length, marked by ditches and alleys. Inside the walls of the house a splendid oak had grown to be 3 ft. in diameter, with a stem 60 ft. high to the first branch. It seemed to be of second growth, and must have been 150 years reaching its proportions as seen in 1828-9."

This must have been the mission of S. François, shewn on Sanson's map.

After the expulsion of the Neutrals the north shore of Lake Erie remained an unpeopled wilderness until a century ago. It was described in maps as "Chasse de Castor des Iroquois." The unbroken forest teemed with deer, bears, racoons, foxes, wolves and wild turkeys, and beaver dams still remain in large numbers to justify the cartographers of two centuries ago. Dollier de Casson and Galinée portaged from Burlington Bay to the Grand River in the autumn of 1669. La Salle, who had been with them, turned back, and left them to proceed without him. They met Jolliet, who gave them valuable topographical information. Then they descended the Grand River to Lake Erie. They built a hut on the bank of a stream opposite Long Point (doubtless Patterson's Creek) and wintered there. After a sojourn of over five months they proceeded westward along the north shore of the Lake. Losing a canoe in a storm and their two canoes being unable to carry more than four men, five of the party had to travel by land.* They proceeded up the lakes to the Sault. Galinée mapped out the north shore of Lake Erie from his own observation.† Before leaving their winter abode, however, they had set up a cross with an inscription, the *procés verbal* of which translated is as follows :

"We, the undersigned, certify that we have seen affixed on the lands of the lake called Erié the arms of the King of France, with this inscription: The year of salvation 1669, Clement IX. being seated in St. Peter's chair, Louis XIV. reigning in France, M. de Courcelle being Governor of New France, and M. Talon being intendant therein for the King, there arrived in this place two missionaries from Montreal, accompanied by seven other Frenchmen, who, the first of all European peoples, have wintered on this lake, of which, as of a territory not occupied, they have taken possession in the name of their King by the apposition of his arms, which they have attached to the foot of this cross. In witness whereof we have signed the present certificate.

François Dollier,
Priest of the Diocese of Nantes, in Brittany.

De Galinée,
Deacon, of the Diocese of Rennes, in Brittany."

* Near one of the creeks (probably Kettle Creek or Catfish Creek) in the County of Elgin, they found the canoe Jolliet had hidden, and the difficulties of their journey were lessened.

† He refers to Sanson's map in his account of the exploration,

With the formal taking possession of the country by the French this paper may fittingly close. Further research may add to our knowledge of the early history and geography of the Neutrals' country. Meanwhile we may admire the wisdom which they displayed in settling in so choice a region as the south-western peninsula of Ontario. The north shore of Lake Erie was well called "the Paradise of the Hurons," and perhaps no portion of it deserved the appellation better than the ancient clearing in the midst of which was erected the earth-work which has been under consideration in this paper, and which in all probability was the residence of the chief Tsohahissen, and the abode for a time of Brebeuf and Chaumonot as they waited the chief's return in that stormy winter of 1641.

JAMES H. COYNE.

St. Thomas, March 16, 1892.

REPORT

OF THE

COMMISSIONER OF PUBLIC WORKS

FOR THE

PROVINCE OF ONTARIO

FOR THE

YEAR ENDING 31st DECEMBER,

1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

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REPORT

OF THE

COMMISSIONER OF PUBLIC WORKS

FOR THE

PROVINCE OF ONTARIO

FOR THE YEAR ENDING 31ST DECEMBER

1892.

To His Honour GEORGE AIREY KIRKPATRICK,
Lieutenant-Governor of the Province of Ontario, etc.

As required by the provisions of the Statute in that behalf, I beg to submit the report of the works, etc., prosecuted under the control of the Public Works Department, during the year 1892.

Details of operations in connection with the Public Institutions and Buildings will be found in the report of the Architect, etc.

The report of the Engineer contains details in respect of locks, dams, slides, etc., also the progress of railway construction during the year.

The usual statements of the Accountant and Law Clerk as to the expenditure in respect of the several appropriations are appended hereto. Special statements with respect to the new Parliament and Departmental Buildings are also appended hereto.

Very respectfully submitted,

C. F. FRASER,
Commissioner.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
December 31st, 1892.

REPORT

OF

THE ARCHITECT, ETC.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, December 31st, 1892.

SIR,—I have the honour to submit the following report :—

GOVERNMENT HOUSE.

After the death of Sir Alexander Campbell, K.C.M.G., the late Lieut.-Governor, and in order to prepare the Government House for the reception of His Honour George Airey Kirkpatrick, the new Lieut.-Governor, the whole of the interior was put in a more complete state of repair, and repainted and papered where required. The plumbing work was carefully examined and, where necessary, refitted, and the gas-fixtures were tested and left in good order. The porches, conservatory, green-houses, fences and outbuildings, were also repaired and painted where required, the whole being now in a satisfactory condition. The furniture and furnishings were also examined, repaired and refitted where necessary, and several new articles of furniture were provided. The grounds also have been kept in good order.

NEW PROVINCIAL PARLIAMENT BUILDINGS.

The whole of the cut stone work has been completed, with the exception of some of the outside carving, which is in progress and will soon be finished. The interior woodwork and finishing of the east wing were so well advanced that the Department of Public Works commenced moving into the new buildings on the 4th of August last. The Treasury Department was moved shortly afterwards, and the Provincial Secretary and Attorney-General's Departments before the end of the year. The apartments and offices for the Crown Lands department are nearly ready and can be occupied early next month. The legislative chamber, library, post office, and the west wing will, it is expected, be ready for the next session of the Legislature. Roads and sidewalks in front and sides of the buildings have been constructed, and considerable progress has been made in laying out and grading the grounds. Additional appropriations for these latter purposes, and also for the general equipment and furnishing of the buildings, will be required.

OLD PARLIAMENT AND DEPARTMENTAL BUILDINGS.

Some repairs have been made and furnishings provided which could not be avoided, but as the departments were to be moved to the new buildings in the Queen's Park, no expenditure was incurred except what was absolutely necessary. The grounds, as usual, have been kept in good order. The rented buildings on Simcoe and Wellington streets have been vacated, and the furniture removed to the new buildings.

ASYLUM FOR INSANE, TORONTO.

The main sewer, alongside the Canadian Pacific Railway switch to the Queen's wharf, being out of repair, has been reconstructed where necessary, and it is in a satisfactory condition for the present. The outlet of the brick sewer is a box drain two feet square, which was diverted by the Grand Trunk Railway Co., when the switch to the Queen's wharf was first constructed, about thirty-five years since, and has been repaired several times. As the city sewer on King street has lately been reconstructed, the grade being below the level of the Asylum sewer where it crosses, it will be advisable to make the connection with the city sewer at this point. If the Central Prison sewer, which now discharges into the Asylum sewer, is diverted to the low level sewer, which discharges into the garrison brick sewer, the brick sewer south of King street and box outlet drain can be abandoned. The main sewer from the Reformatory for Females, which now discharges into the Asylum sewer, can also be diverted into the King street sewer. Arrangements would have to be made with the city Board of Works for permission to use the sewer and for making the connections. By agreement with the city in 1879, when the Queen street sewer was constructed, the grade was sufficiently low for the drainage of the Asylum buildings, if at any future time it should be found necessary to do so, and for which privilege the amount of $4,000 was paid in 1880. It would, however, be more convenient, and less expensive, to make the connections with King street, as both sewers discharge into the garrison creek sewer.

MIMICO COTTAGES.

The two refractory cottages, the north-west one for males and the south-west one for females were completed in the early portion of the year, and occupied in April last. An additional storey was constructed in the south-west cottage, the level of the ground being lower than at the other cottages. The total number of cottages is ten, five for males and five for females, affording accommodation for 550 patients, being an average of 55 for each cottage. The cottages were completed under the superintendence of Mr. R. Chisholm, Clerk of Works. The bridge for the front entrance road was constructed, and some grading done at each end by Mr. A. J. Brown, contractor for the sewage disposal works. The remaining portion of the grading for the entrance road will be done by the labour of the patients, as previously arranged. Six additional steam radiators were placed in the matron's and attendants' rooms in the main building, as the indirect heating was found to be insufficient, the rooms being more exposed than other portions of the building, having a western aspect. The house for working patients on the farm, and the entrance lodge, were completed and occupied in the early part of the year. Considerable delay occurred in completing and testing the sewage disposal works, owing to leakage in the precipitating tanks, which required some time to make them tight. A steam pump and boiler had to be supplied to replace a windmill pump, which had not sufficient power to pump the sludge, and a retaining wall had to be built on the edge of the bank. When these works were completed the sewage was treated with ferozone, about the 14th of August, and has been successfully dealt with since that time. In order to complete the sewage disposal works, it will, in my opinion, be necessary to construct filtering tanks of a similar construction to those in operation at the sewage disposal works of the Deaf and Dumb Institute.

The following is a description of the sewage disposal works which were constructed under the superintendence of Mr. Horetzky of this Department :—

The system of sewage disposal at this place is similar to that of the Deaf and Dumb Institute at Belleville, but *without the polarite filter beds*, the partially clarified effluent being allowed to discharge into the lake without filtration. The process employed is one of chemical precipitation by *ferozone*, which the International Co., of London, England, thus describes :—

"*Ferozone* is the trade name of the material successfully used in deodorizing sewage and precipitating the solids therefrom. It is a cheap preparation, acknowledged to be the best and most powerful precipitant and deodorant for sewage purification. It is rich in salts of iron, alumina, and magnesia, and also contains magnetic oxide of iron in a very spongy and absorbent condition. By virtue of its soluble iron, alumina and magnesia salts, it soon causes subsidence of the suspended solids. The iron oxide being porous and magnetic, parts with its polarized oxygen, and thereby helps to disinfect and deodorize the sewage and sludge. It attacks the molecular constitution of that portion of the organic matters in solution which cannot be removed by precipitation in the settling tanks. It so alters the constitution of these putrescible matters that further oxidation thereof by filtration through polarite becomes certain, and under complete control at all times. The sludge precipitated is richer in ammonia than that produced by the lime process, and is therefore of more value as a fertilizer."

"In carrying out the process of purification, the sewage, on reaching the outfall works, is run through strainers to arrest floating solids, such as corks, rags, etc., and then flows quietly through a floating sill into a settling tank, the floor of which inclines towards the centre, so that a gutter may convey the sludge to the outlet valve. Before entering the tank, the crude sewage receives a dose of ferozone, which costs about two cents for every thousand gallons of sewage treated. This is added automatically by placing a basket of ferozone in the flowing sewage. The ferozone causes deodorization and precipitation to take place in the sewage, and a considerable part of the albumenoids in solution to coagulate and to be precipitated with the solids. The supernatant sewage-water thus partially clarified is drawn off and run into the lake."

The precipitated sludge is allowed to accumulate in the tank bottoms for a few days, and is then run into a sludge well, whence it is pumped weekly to the surface and carted away for manure. It is found, however, that the large quantity of water, which it is impossible to separate from the heavy sludge, gives great trouble, and increases cartage to the fields where deposited. This can be remedied by special contrivances and reprecipitation, which can be carried out in this case, for a very moderate amount. It is estimated that, were this improvement carried out, the weekly deposit of very liquid sludge will be reduced from 40 cartloads to 5 cartloads of concentrated semi-fluid manure, of great value to the land.

The buildings include a mixing house, where the ferozone is applied to the sewage, and the pump and precipitating tank houses, the tank capacity being about 28,000 gallons. The daily flow of sewage from the Institution is about 45,000 gallons. In order to complete the present works and produce a satisfactory effluent, the latter should be passed through artificial filters of polarite and sand. The cost of ferozone (freight and duty paid) is, on an average, $30 per ton. Polarite is more expensive, but does not require more than the first outlay, as it lasts for several years. That mineral costs, laid down at Mimico, about $48 per ton.

The following are reports by some English authorities upon the system adopted :

"That the Company's process of precipitation, deodorization, and filtration meets all requirements of sanitarians is established beyond doubt by actual experience of sanitary authorities who are using it, and by the following reports.

Abstract from a report of Sir Henry E. Roscoe, M. P., F. R, S., L, L. D., Ph.D., Professor of Chemistry, &c. :—

"To the directors of the INTERNATIONAL WATER AND SEWAGE PURIFICATION COMPANY, LIMITED.

"I have at your request investigated, and now beg to report upon your process for the Purification of Sewage as carried out at Acton, (near London. England).

"Many samples of the tank liquid, and the filtered effluent were taken by Mr. Lailey, the Engineer to the Acton Local Board, and also by my assistant, Mr. Joseph Lunt, B. Sc., and these were analysed. I found the resulting filtered effluent to be bright, clear and colourless, and free from any objectionable smell, ... Samples of the effluent have been kept in absence of air for nearly two months, and have still retained their good qualities. They exhibit no trace of putrefactive change, but have rather undergone improvement, inasmuch as in most cases a slight green growth has taken place, showing that the effluent is in a condition to be acted upon by the natural influences which will tend further to improve the water whilst flowing along a stream. I have always found that the filtered effluent was equal in appearance to the sample taken on the day of my visit, viz., bright, clear, colourless, and free from objectional smell. Many samples of this filtered effluent have been analysed. . . . . The porous nature of the oxide which is used in the filter, its complete insolubility and its freedom from rusting, constitute in my opinion, its claim to be considered a valuable filtering material. . . . The filtration removes all the suspended matter, and a further purification is affected by the porous magnetic oxide, which on absorption of organic matters in its pores, oxidizes it by help of the dissolved oxygen existing in the liquid,

"The filter beds at Acton have now been in use for fourteen months, the only cleansing having been the removal of the surface layer of sand.

"I am, gentlemen,

August 20th, 1888, "Yours truly,

"(Signed) HENRY E. ROSCOE, F. R. S."

The Company have permission to publish the following abstract from a Report made by Dr. E. Frankland, Ph. D., D. C. L., L.L.D., M. D., F. R. S. (one of Her Majesty's Commissioners to inquire into the Pollution of Rivers), to Major Tulloch, R. E. (the Chief Engineering Inspector of the Local Government Board), on the results of his investigation of the above named Company's process as carried out at the Sewage Works near Acton, where the crude sewage is first treated with ferozone in subsidence tanks for precipitation, and the effluent therefrom is passed through polarite filter-beds for final purification :—

"These results show that the raw sewage contained a very large proportion of highly polluting suspended matter, and an unusually large amount of foul

organic matter in solution; and further that the effluents from the subsidence tank and filter were derived from sewage of about equal polluting power as regards dissolved organic matter.

"In the subsidence tank the suspended matter was reduced from 240·80 parts per 100,000 of raw sewage to 5·92 parts per 100,000 of tank effluent, whilst the effluent from the filter was free from suspended matter. It was clear and transparent. This is a satisfactory result.

"The effect upon the dissolved organic matter in the subsidence tank is very remarkable, its amount being reduced to little more than one-tenth of that present in the original sewage.

"In its subsequent passage through the filter the dissolved organic matter is still further reduced to nearly one-sixteenth of that present in the original sewage. It is now in a state of purity greatly exceeding that prescribed by the standards of the Rivers Pollution Commissioners.

"No chemical process of purifying sewage has ever, in my experience, approached this in efficiency; and if the results obtained at Acton can be accomplished in other places, a most important advance will be made in the purification of the sewage of towns.

"I need scarcely add that the effluent from the filter is not only clear, but inodorous and inoffensive. It is of course not fit for dietetic purposes, but it may be admitted in large volumes into running water without creating any nuisance."

A copy of Dr. Frankland's complete report, with details of his analyses, may be seen at the offices of the Company. Dr. Frankland's investigation was made unknown to the Company, for Major Tulloch, R. E., and not for, or at the request of, the Company.

Report of analyses of crude sewage and purified effluent taken from the Acton Sewage Works on 30th August, 1890:—

"The Cliff, Higher Broughton, Manchester,

"September 17th, 1890.

"I enclose the analyses of the crude sewage and also of the effluent. These samples I took myself from the Acton Sewage Works, on Saturday, August 30th, 1890.

"The effluent was flowing exactly like clear spring water, and when the sample was put into the bottle there was not the slightest odour of any kind, and it would have been impossible for any one to have said, judging by the appearance, that it was not good drinking water. The analysis also shows that the reduction of the putrescent matter has been very great, and that such an effluent as this may be run into any stream with perfect safety. I am surprised to find that after more than three years working, the filter beds can produce such a good effluent.

"(Signed) J. CARTER BELL, A. R. S. M., F. I. C., &c.,

"County Analyst for Chester, Salford, &c."

The foregoing reports and analyses show that the purifying power of the polarite filter-beds at Acton increased rather than diminished with prolonged use. *Mr. Carter Bell's investigation was made after they had been in continuous use over 3¼ years, and shows 95 per cent. of the albumenoid ammonia was removed.* This is rather better than the excellent results previously found by Dr. Frank-

land, and those of the still earlier investigation by Sir Henry E. Roscoe, M. P. The Acton Works were not designed to carry out the International Company's process of purification, but for an entirely different system and afterwards adapted to use ferozone and polarite at a cost of less than £400. If the works had been originally constructed to carry out the International Company's system a considerable saving would have been effected in cost of construction."

ASYLUM FOR EASTERN ONTARIO.

The site chosen for the erection of the Eastern Asylum buildings is lot number six in the first concession of Elizabethtown, adjoining the eastern limit of the Town of Brockville.

The lot is 1,300 feet in width, and 3,700 feet in length, extending from the line of the Grand Trunk Railway on the north to the River St. Lawrence.

The main road from Brockville to Prescott passes through the southerly front about 800 feet from the river.

There are 90 acres north of the main road and 20 acres south of the road, and the buildings will be erected on the highest point of the lot, 154 feet above the river, and about 1,000 feet north of the main road.

The plans and specifications for main and central buildings, and six cottages, three for males and three for females, were prepared during the summer, and tenders were received on the 29th of September, the lowest being that of Garson. Purcer & Co., of Saint Catharines, which was accepted.

The excavation for the foundations of the main and central buildings has been made to a great extent, the material having been used to form the road and terrace in front.

A large quantity of stone and lumber has been hauled on the site, and stone cutters will soon be at work preparing the work for next season.

The buildings will have a south-eastern aspect, so that the front, sides and rear will be exposed to the sun's rays for some time during each day.

The view from the site in all directions is very extensive and very attractive and especially so to both eastward and westward, whence in both directions can be seen splendid and magnificent stretches of the River St. Lawrence.

Owing to the great elevation, there will be no difficulty with respect to an efficient drainage, and the water supply can be easily obtained from that part of the premises known as Picken's point, where the bank is steep, and a strong current runs close to the rocky shore with not less than 20 feet of water at its very edge.

The Eastern Asylum will comprise a main and central building for acute patients, and six separate cottages for chronic patients.

The main building will be four hundred feet in front, and 50 feet in width, with projections for dining and day rooms and dormitories 72 feet in width.

The administration building and officers' apartments will be in a building 60 feet square in the centre, and 50 feet distant from the main building, connected by a passage.

The kitchen and pantries connected with the dining rooms on each side will be immediately in rear of the central corridors, and the sculleries and store room will be connected with the kitchen.

The bakery will be in the basement under the kitchen, and the laundry, boiler house, chimney, coal vault and steward's store rooms will also be in the basement in rear of the bakery.

The projection in the rear for the above will be 200 feet by 40 feet, with wings 34 feet by 40 feet.

The steward's office and store rooms will be on the ground floor in the eastern projection, and the drying and ironing rooms will be over the laundry in the western projection. The work and assembly room will be over the boiler house and the large water tower will be near the chimney.

The wings will be two storeys in height with basement, and will afford accommodation for 85 males and 85 females, separated in the centre by apartments for the assistant matron, and sewing room on the female side. There will be 38 separate rooms in each wing for patients, with pantries and dining rooms on each storey, also attendants' and bath rooms, staircases, water closets, linen rooms, etc.

The corridors will be 12 feet in width and storeys 12 feet in height. There will be verandahs on the front to each wing for both storeys.

The basement corridors under each wing will be required for steam pipes, indirect radiators, fresh air ducts, etc.

Several of the basement rooms, if required, can be made available for working patients.

On the ground floor of the administration building will be the office, etc., for the superintendent, the reception, Bursar's, and matron's rooms, dispensary, and officers' dining room.

On the second floor will be the superintendent's and matron's apartments and female attendants' room, on the third floor the bath room, water closets, etc.

The cottages will be six in number, 55 patients in each cottage, or 330 patients, to which must be added the accommodation in the main building for 170 or in all 500 patients.

The distances between each cottage and the main building will be about 50 feet, and receding from the front, so as not to interfere with the view from the corridors or the access of light and air, all of which are important arrangements on sanitary grounds.

Tramways will be constructed from the kitchen to the rear of each cottage for the conveyance of food, etc., in covered wagons.

Each cottage will be 80 feet by 40 feet, with projections in the rear for dining rooms 42 feet by 28 feet and two storeys in height, with bathrooms etc

There will in each cottage be 34 separate apartments, and associated dormitories for 21 patients, with dayrooms, attendants' rooms, pantries off dining rooms, store rooms, water closets, etc,

The basements will be fitted with hot water apparatus, indirect radiators hotwater coils, air ducts etc.

In each apartment, day room, corridor etc., for the main and central building, and for each cottage, there will be a fresh and foul air duct ensuring thorough ventilation.

Direct steam and hot water radiators will be placed in day rooms, halls, and corridors throughout, in addition to the supply of warm air from the indirect system which will be applied to the main building and cottages.

This system has been successfully applied to other buildings recently erected under the superintendence of the department, and after some years experience has been found quite efficient.

The steam for the main building will be supplied by four steam boilers for low pressure heating, and one high pressure steam boiler for cooking and laundry purposes, also a hot water boiler for the supply of baths, sinks etc.

The basements will be built of limestone procured in the neighbourhood of Brockville, and the cut stone will be procured from quarries about 5 miles distant.

The outside walls of the basement above ground line will be rock faced.

The walls above the basement will be built of cherry coloured pressed bricks with red mortar for the outside, and ordinary bricks for inside work.

To avoid the effects of damp, the walls will be built hollow, one brick in thickness for the outside, a space of two inches, and a half brick, or one brick in thickness on the inside, bound together with hoop iron.

The plinth, window and door heads and sills, string courses, coping, chimney caps, steps, etc., will be of cut stone with terra-cotta panels, ornaments etc.

The porte cochere will be of Gloucester stone with polished red granite columns, and moulded caps, bases, and arches of fine tooled work.

The roofs will be constructed of Canadian slate with galvanized iron cornices, eaves, downpipes etc., also roofs of tower and cupolas.

The basement floors throughout will be constructed of Portland cement concrete, also the floors of water closets, on brick arches, supported by rolled steel joists. The bases in the wings and cottages will be of Portland cement and painted.

The floors above the basements will be laid with maple or other hardwood, on dressed boarding, the steps of stairways will be of oak and the hardwood of the floors, stairways etc., will be twice oiled,

In addition to the buildings now under contract to be completed in two years, an amusement hall, a building for religious services, workshops, driving house, outbuildings etc, will be required.

ASYLUM FOR INSANE, LONDON.

Plans and specifications were prepared for the erection of the annexes for six dining rooms, three for each wing of the main building in place of the two large associated dining rooms in the centre portion, which will be converted into dormitories, thereby affording accommodation for additional patients.

Tenders were received early in June after due advertisement, and the lowest being that of John Purdom, London, was accepted. Water towers with iron tanks, holding 20,000 gallons each, connected with the tanks in the main building, thereby increasing the storage capacity, 40,000 gallons, have been constructed in connection with the annexes, which will further provide separate dining rooms for each storey in the east and west wings,

The work has progressed in a satisfactory manner and will be completed early next year.

The steam heating of the annexes has been done by the employment of steam fitters, under the direction of the asylum engineer, and the materials have been purchased at market rates. This work was done in connection with the

re-construction of the steam heating of the main asylum building, and the construction of the central boiler house, the steam heating for the above having been done under the engineer's direction, as before described.

When the annexes have been completed and occupied the dining rooms in the centre portion will be altered to dormitories, by the construction of a passage 12 feet wide across the same, which will connect the centre hall on the first and second stories with the corridors in the rear, leading by stairways to the amusement hall, and to the ground floor, thereby affording additional facilities on these stories, for approaching or leaving the amusement hall, or the adjoining apartments in case of accidents.

Tenders were received in September for the cottage near the slaughter-house, after due advertisement, and the tender of John Purdom being the lowest was accepted. The work is nearly completed.

The above works have been superintended by Mr. C. Bodley Clerk of Works.

ASYLUM FOR INSANE, HAMILTON.

The works in connection with the barn, were completed early in the year, and the building, with cow and horse stable occupied,

The tank-house and water-supply pipes were also completed, and a stationary pumping-engine provided, and connected with the fire protection pipes and hydrants.

Plans and specifications were prepared for the erection of the dining room annexes and covered ways to each wing of the main building, and after due advertisement tenders were received early in June, the tender of F. W. Schwendimann being the lowest was accepted. The walls have been built and the annexes roofed, but the plastering and interior carpenter work has yet to be completed. The annexes will be heated with hot water, for which an appropriation will be required.

When the new dining rooms have been completed and occupied, the old dining room in the rear of the main building will be divided by a 12 feet passage forming a corridor in the centre, and dormitories constructed on either side with bath rooms, water closets, etc.

Plans have been prepared for the purpose, and an appropriation will be required for the alteration of the old dining room.

The construction of the Infirmary was postponed, as the place has not yet been decided on or considered, and the amount will have to be re-voted.

Some repairs had to be made to the main tile sewer leading down the incline of the mountain, and in the rear of the main building.

The works were done under the superintendence of Mr. H. G. McMahon, Clerk of Works.

The gravel roof at the pumping engine house on Queen street, being in a leaky condition, was repaired.

Having inspected the work in connection with the west end sewer, into which the main asylum sewer discharges, I reported the same as complete, and the amount of $7,500 was paid to the City of Hamilton, according to agreement.

ASYLUM FOR INSANE, KINGSTON.

The works in connection with the slaughter house, cowstables, and piggery were completed in the early part of the year and handed over to the asylum authorities.

Tenders were received early in June after due advertisement, for the extension of water supply pipes three inches in diameter of cast iron, from the main asylum to the farm buildings, the rock excavation and filling to be done by asylum labour, and the tender of Elliott Bros., Kingston, being the lowest was accepted. The pipes and hydrants were duly tested when completed, and the work was satisfactory in every respect.

The work done by the patients, being rock excavation and filling over the pipes, was also completed in a satisfactory manner.

The auxiliary pumps and connections were also tested.

ASYLUM FOR IDIOTS, ORILLIA.

The old farm house on the asylum land was repaired under the directions of the superintendent, by the asylum carpenter, with the assistance of some of the patients.

The materials and skilled labour were provided by this department,

Large galvanized iron ventilators were placed in the roof over the kitchen ceiling as recommended by the superintendent and the Inspector of Asylums.

REFORMATORY FOR BOYS, PENETANGUISHENE.

On the 8th of March a fire occurred in the boiler house under the carpenter's shop, the roof and woodwork were destroyed. An appropriation was made for a new roof, the walls being of stone and brick, and the workshop was repaired with the assistance of the boys, the expenditure being under the control of the Inspector of Prisons.

REFORMATORY FOR FEMALES, TORONTO.

Repairs were made to the steam pipes in the basement, also to the roofs water closets and drains as required.

CENTRAL PRISON, TORONTO.

No expenditure on capital account by this Department was required at this Institution.

INSTITUTION FOR THE DEAF AND DUMB, BELLEVILLE.

Plans and specifications were prepared for the re-construction of the bakery, with dormitory for attendants on the upper storey, and after due advertisement, tenders were received early in June, the lowest being that of John Forin, Belleville. The bakery was ready on the return of the pupils early in September, and the dormitory was completed a short time afterwards. The work was done under the superintendence of Mr. W. J. Smith, Clerk of Works.

The steam heating of the main building and rear addition was re-constructed direct radiators having been placed in the day rooms and dormitories.

The steam heating altered to low pressure is now in a satisfactory condition.

Additional radiators to replace coils will be required in the dormitories and main building.

There was some delay in completing the sewage disposal works, as the tanks were not water tight, owing to the depth of the rock excavation, the level of the main sewer being but a few feet above the level of the water in the bay. A steam pump had to be provided to pump the effluent from the precipitating tanks to the filtering tanks.

The daily quantity of sewage treated with ferozone and polarite is 25,000 gallons, and the refuse sludge is carted away and used as manure on the farm.

The Works were completed in October, under the superintendence of Mr. Horetzky of this department, and have since been under the charge of an employée of the Institute.

In addition to the treatment by ferozone in precipitating tanks, as fully described in the sewage disposal works for the Mimico cottages, filtering tanks have been constructed, in which the effluent from the precipitating tanks is treated with polarite, which is thus described in the prospectus of the International Sewage Purification Co. London, England. "Polarite is the trade name of the material used for filtering and further purifying the ferozoned sewage-water from the putrescible matter dissolved therein. It is a black, hard, porous and magnetic substance, insoluble in water, and practically everlasting. It is a powerful deodorizer and decolorizer."

The Institute is now supplied with water from the city water works, in accordance with arrangements made by the Inspector of Prisons.

INSTITUTION FOR THE BLIND, BRANTFORD.

The connection between the main sewer of the Institute, and the city sewer on Brant avenue was made in October, but on inspection it was found that the manhole at the Institute had not been ventilated, and the intercepting gratings had to be changed. This was done, and on the 15th of December I inspected the work again, and tested the flush-tank, and ventilation, grating, etc , which were found quite satisfactory. This was duly reported, and the payment of $8,000 recommended. The brick sewer on the grounds connecting the tile pipes from the main building and laundry with the manhole, was found to be in want of repair. This sewer was taken up and a nine-inch tile pipe substituted, making junctions with the branch tile pipes, etc. The sewerage of this Institution is now in a satisfactory condition.

AGRICULTURAL COLLEGE, GUELPH.

The works in connection with completion of the Convocation Hall, laboratory and green-houses were continued by the contractor and the Convocation Hall and laboratory were occupied in June. Tenders for the hot water heating of the laboratory and green-houses were received, the tender of Messrs. Purdy, Mansell and Mashinter, being the lowest was accepted, and the heating was completed in October. The water-closets, soil-pipes and baths in the College building and Professor Shaw's house were re-constructed and placed in a proper sanitary

condition, the fittings and soil pipes having been in use for several years. Tenders were received for the erection of a farm piggery, and two additional greenhouses, after due advertisement, the tender of Frank J. Hough of New Toronto, being the lowest, was accepted. The remaining appropriations on capital account being under the control of the Hon. Minister of Agriculture and the College authoritities, were transferred, and the expenditure charged accordingly.

These works were under the superintendence of Mr. J. Brown, Clerk of Works.

Description of the Sewage Disposal Works.

All the sewage from the Institution, excepting the liquid waste from the baths on the west side of the main building, the liquid slops from the east wing and the laboratory, is conveyed to the precipitation tanks, whence, after treatment by ferozone, the partially clarified effluent is run on to two filter beds composed of gravel and sand 2 feet 6 inches in depth and of an aggregate area of about 700 square yards.

From March to November these beds are worked satisfactorily but during the three severe winter months they freeze up and the filtering process ceases, the effluent finding its way into the creek.

The waste from the baths and laboratory which does not undergo ferozone treatment is intercepted in an underground tank, and the overflow spreads over the soil and is absorbed without creating any serious nuisance.

During the nine open months of the year, the sand filters purify the sewage effluent fairly well, but require constant care and raking, so as to enable the sun and atmosphere to work upon the organic matter held on the surface. The filtered effluent from the underdrains passes to the creek, and through the adjoining farm without giving rise to complaint or causing a nuisance.

EDUCATION DEPARTMENT, NORMAL AND MODEL SCHOOLS. TORONTO.

Tenders were received in April for the construction of an iron fence round the grounds, the lowest being that of R. G. Olmstead, Hamilton, was accepted. The tender of Messrs. Elliott & Son was also accepted for the decoration and painting of the Assembly Hall, or theatre, which was altered last year, and the work was completed according to agreement, under the superintendence of Mr. John Drew, Clerk of Works. The drains and flooring in the caretaker's apartments in the front building were repaired. The drains under the Normal School building were also repaired. Some changes had to be made in the steam-heating and radiators in the rooms of the front building, and repairs were also made to the water-closets, etc. Some furniture and furnishings were provided as required.

NORMAL SCHOOL, OTTAWA.

The work in connection with the addition for the Assembly and class rooms was continued by the contractor, and the whole work completed in a satisfactory manner under the superintendence of Mr. A. R. Macdonald, Clerk of Works. Tenders were received early in June, after due advertisement, for the construction of an addition to the boiler-house, the lowest being that of J. White, Ottawa, which was accepted. Tenders also were received at the same time for the steam-heating of the addition

for the Assembly Hall, etc., including a new steam-boiler, and the work was done in a satisfactory manner in time for the opening of the class rooms. The furniture for the Assembly Hall and class rooms was provided by the Smart Manufacturing Co., that company having fitted up the other class rooms. The usual repairs were made to the ceilings and flooring in the Normal and Model School buildings, and the plastering was repaired where required. Two partitions were constructed across the large class rooms on the ground and first storeys. The playsheds and outbuildings were also removed, not being any longer required.

SCHOOL OF PRACTICAL SCIENCE, TORONTO.

The "general equipment of the Engineering laboratory" which has been under the control of the Professor of Engineering was continued during the year, and so far as the appropriations were provided, have been completed Sundry repairs were made to the roofs and drains as required during the year.

OSGOODE HALL, TORONTO.

The ordinary repairs to the roofs and drains were made as required, and the boiler furnaces were also repaired as usual. Furniture and furnishings were supplied as required.

ALGOMA DISTRICT.

Repairs were made and furniture provided for the court house and gaol at Sault Ste Marie. Repairs were also made to the lock-up at Gore Bay, and furniture provided for the court room. Ordinary repairs were made to the other lock-ups in this district, and furniture provided as required.

THUNDER BAY DISTRICT.

Ordinary repairs were made and furniture provided for the court house and gaol at Port Arthur. Repairs were also made to the lock-up and Court room at Fort William as required.

MUSKOKA DISTRICT.

Tenders were received in September after due advertisement for the erection of an addition to the lock-up at Bracebridge, and the tender of James Craig, Barrie, being the lowest was accepted. The work has progressed under the superintendence of W. C. Mackenzie, Clerk of Works, and will soon be completed. Tenders were also received for heating the addition and lock-up with a combination furnace, the lowest being that of the Gurney Foundry Co., which was accepted. Sundry repairs were made and furniture provided for other lock-ups in the district.

PARRY SOUND DISTRICT.

Ordinary repairs were made and furniture provided for the court room, lock-up and registry office at Parry Sound, as required. Tenders were received in September after due advertisement for the erection of a log lock-up at French River, the lot for same having been given by The Ontario Lumber Co., and the tender of Alfred Badger, Parry Sound, being the lowest was accepted. The

tender of Mr. Badger having been subsequently withdrawn, the next lowest, that of Adams and Broadbent, Parry Sound, was accepted. The work has been completed under the superintendence of W. C. Mackenzie, Clerk of Works. The necessary furniture for this lock-up has been provided.

NIPISSING DISTRICT.

Plans and specifications were prepared for the construction of a new lock-up and keeper's house at Sudbury in place of those destroyed by fire on the 7th of June last. Tenders were received in September after due advertisement, the lowest being that of Robert Burdett, Collingwood, which was accepted. The work has progressed in a satisfactory manner under the superintendence of W. C. Mackenzie, Clerk of Works, and will soon be completed. Tenders also were received for heating the court room, residence and lock-up, with a combination furnace, the lowest being that of M. C. Drew, Burk's Falls, which was accepted. This latter work will be completed when the court room etc., are ready for occupation. Repairs were made and furniture provided for the court room and lock-up at North Bay, as required, and recommended by the Inspector of Prisons.

RAINY RIVER DISTRICT.

Ordinary repairs were made and furniture provided for the court room, lock-up and registry office at Rat Portage as required. There has been no expenditure on account of the addition to the lock-up, Rat Portage, as the appropriation was not sufficient for the proposed requirements, as recommended by the Inspector of Prisons. An addition to the revote of the unexpended balance will therefore be required for the larger addition next year.

A log lock-up was built at Fort Francis, under the superintendence of W. P. Maclean, Clerk of Works. The work has been done by the day and materials provided, as there would have been no probability of the department being able to procure tenders from responsible parties for work in that remote locality. The work has been done in a satisfactory and economical manner, and the lock-up has been fitted up with the necessary furniture. This lock-up was built on a lot of 5½ acres which was reserved for that purpose by the Crown lands department.

MISCELLANEOUS.

There has been no expenditure on account of repairs at Brock's monument this year. Ordinary repairs will be required next year, for which the balance of the appropriation will be sufficient. The fences and grounds in connection with this monument have been kept in good order.

I have the honour to remain,
Your obedient servant,

KIVAS TULLY,
Architect, etc.

Hon. C. F. Fraser,
Commissioner of Public Works,
Ontario.

REPORT

OF THE

ENGINEER OF PUBLIC WORKS.

Department of Public Works, Ontario,
Toronto, 31st December, 1892.

Hon. C. F. Fraser, *Commissioner of Public Works, Ontario*:—

Sir,—I have the honour to submit the following report on works which have been attended to by the Department, also respecting the extension of railways throughout the Province, during the year 1892:—

MAGNETAWAN RIVER IMPROVEMENT.

The improvement of this river, below the Village of Burk's Falls, has been continued during the present year. Operations were resumed in the latter part of March at the first bend in the river below the present steamboat wharf, where work was suspended in December, 1891. The dredging was continued until a channel 45 feet in width had been excavated through the obstruction at this point, the material removed consisting of boulders and hardpan. The dredge was then moved up the stream a short distance to a point about 200 feet below what is known as "Burk's wharf," where operations were resumed, and continued until the channel had been improved for a length of about 450 feet and a width of 45 feet, the material removed consisting principally of sand, slabs and sunken timber. The dredging plant was then taken down the river to within about 3 miles of Se-Se-be lake, where a portion of a sandy shoal, which interfered with navigation was removed and a sufficient channel provided. Three points or bends in the river, two situated about three miles and one about five miles below Burk's Falls, have also been improved, the material removed being principally sand. At "Pope's Point," situated about one mile above the Village of Magnetawan, a channel 300 feet in length and 70 feet in width has been excavated through a shoal of boulders and gravel, and four large buoys placed to indicate its position. A buoy has also been placed at a rocky point on the north side of the river above "Munroe's Landing."

At Magnetawan a shoal of solid rock 35 feet in length and 14 feet in width, situated about 100 feet above the swing bridge and opposite the steamboat landing, has been removed by blasting and dredging, and a rocky point, about 30 feet in length and 9 feet in width, has been removed in a similar manner from the northerly side of the river, about 100 feet below the bridge.

The channel has also been improved by the removal of a quantity of loose rock and boulders, and buoys have been placed to indicate its position from a point about 300 yards below the swing bridge to the lock.

The work was continued until the latter part of September, after which the dredge and scows were taken to Magnetawan, placed in a safe position and left in charge of the lockmaster.

PENINSULA CREEK IMPROVEMENT.

A re-vote of the small, unexpended balance of this appropriation was taken last session to enable some minor works, required to satisfactorily complete the improvement commenced in 1891, to be attended to during the present year.

Operations were resumed about the 1st of March and continued until completion, about the end of that month.

The work consisted of filling one of the cribs at the easterly end of the canal with stone, and grading and leveling off the adjoining bank.

A pier has also been constructed at the westerly end of the canal, to indicate the exact position of the channel and enable it to be entered without difficulty at night.. The pier is 12 feet square and 9 feet in height, built of 12x12 inch square timber, and compactly filled with stone. It has a conical shaped framework built upon it about 12 feet in height, the framework being sheeted in with one-inch dressed lumber, painted white. The pier at the easterly end of the canal, which is similarly constructed, also received a coat of white paint.

BALSAM RIVER WORKS.

The following works have been attended to out of this appropriation during the present year :—

The river has been improved by the removal of boulders from a point 750 feet above the swing bridge down stream a distance of 2,750 feet. The bed of the stream, which is solid rock, was cleared so as to give a channel 50 feet in width with a minimum depth of 4 feet 8 inches when the water is 6 feet 3½ inches on the lift-wall of the lock. The channel has been buoyed from the first bend in the river above the lock to the point where the improvement was commenced in Balsam Lake.

A pier and boom has been constructed and placed above the swing-bridge at the village of Rosedale, to guide steamers and scows between the bridge piers and protect them from injury. The pier is 12 feet square and 10 feet in height, constructed of 12x12 inch square timber, and compactly filled with stone. The boom which extends from the pier to the bridge is 120 feet in length and 2 feet 6 inches in width, constructed of 2x12 pine planking, well spiked together with 6 inch pressed spikes, and bolted through every 10 feet with ⅞ inch wrought iron bolts. A guide boom 205 feet in length has also been placed above the lock, and one 86 feet in length has been placed below. The booms are both 2 feet 6 inches in width, and are constructed of 2x12 inch pine planking spiked and bolted together in a similar manner to the boom above the bridge. Repairs have also been made to the valve rods and sheeting on the lock gates, and the northerly end of the dam has been gravelled to make it watertight.

GULL AND BURNT RIVER WORKS.

Improvement of "Jacob's Ladder."

The work attended to out of this appropriation consisted of blasting a channel through a rocky obstruction known as "Jacob's Ladder," on the Burnt River in the township of Galway.

Operations were commenced during the season of low water, in the latter part of August, and continued until the middle of October, when the work was brought to a close.

Landing Pier at Port Elgin.

The public landing pier at this village has been improved by the formation of a gravel embankment extending from the shore outward for a distance of about 300 feet. This embankment will form a permanent roadway and considerably lessen the cost of maintenance of the pier in future, owing to the decrease in the length of the wooden structure which formerly had to be kept in repair. The remaining portion of the pier having a superficial area of about 6,000 square feet, has been replanked with four-inch planking, and otherwise repaired.

Upon the completion of the work, which was carried out by the local authorities, the department was notified and an examination was made and it was found satisfactorily performed. The amount of the appropriation of $750 in aid of this work has accordingly been paid.

MAINTENANCE OF LOCKS, DAMS AND SWING BRIDGES.

The following repairs and improvements have been attended to out of this appropriation during the present year.

Mary's Lake Dam.

This dam has been supplied with four new windlasses and three new windlass frames, and repairs have been made to the stop-log posts. A portion of the planking on the stop-log platform has also been removed, and two of the piers which support the boom above the flood dam, situated at the foot of the rapids below, have been taken down to the water line and levelled up and rebuilt. Repairs have also been made to the flood dam by levelling it up and filling in and around it with gravel and stone, the original filling having been washed out and the north-easterly portion undermined during the spring freshet. The dam has also been supplied with a new apron, 14 feet in width, and covered with 3-inch pine planking. The apron extends from the slide to the shore pier, a distance of 121 feet.

Mary's and Fairy Lakes Lock, etc.

The gates of this lock have received two coats of white paint, and some sunken logs, stone and other debris have been removed from the canal above the lock. The dam has been supplied with six new stop-logs.

Magnetawan Lock.

The balance beams on the gates of this lock have been painted, and repairs have been made to the valve gearing. Some gravel and other debris has also been removed from the lock chamber.

Ah-Mic Lake Dam.

Three piers have been constructed above this dam to support the guide boom which was provided in 1891.

The shore or anchor pier is 8x10 feet square and 5 feet in height, the other two being 18 feet square and 21 feet in height. The piers are built of round timber to low water level and of square timber above, the whole being securely fastened together with $2\frac{1}{4}$-inch oak trenails and $\frac{3}{4}$-inch square wrought iron drift-bolts, and the cribwork is compactly filled with stone.

Port Carling Lock, etc.

The new gates for this lock, which were constructed last year have been placed in position and painted, and the swing bridge has been adjusted and provided with three new wheels. Three new windlasses have also been provided for the dam.

Port Sandfield Swing Bridge.

The turntable of this bridge has been supplied with two new wheels, the bridge adjusted and other minor repairs made thereto.

Dams, etc., at Bala.

The bridge below the long dam has been painted and the dam supplied with two new stop-logs, and repairs have also been made to the stop-log posts.

Dam at Norland.—Gull River.

This dam has been supplied with two new stop-logs.

Elliott's Falls.—Dam and Slide.

The westerly side dam has been provided with a new course of timber on top for its entire length of 152 feet, and the face of the cribwork has been double-sheeted with one-inch pine lumber to a height of seven feet. The slide in the main dam has been provided with three new floor sills and new hardwood flooring 4 inches in thickness for a length of 10 and a width of 17 feet, and the stop-log posts have been repaired. About one-half the stop-log platform has also been replanked with 3-inch pine planking, and two new sets of windlass frames and one new stop-log has been supplied.

The fronts of the piers at the lower slide have been sheeted for a length of 10 feet and to a height of 7 feet with hardwood planking, 4 inches in thickness, to protect them from being injured by saw-logs and timber.

Racketty Creek Dam and Slide.

One of the piers in the dam at the head of the slide, 22 feet in length and 8 feet in width has been rebuilt 4 feet in height with 12x12-inch square timber, and the two top courses of timber on two other piers of a similar width, but 27 and 37 feet in length, each respectively, has also been renewed.

The slide has been entirely reconstructed, the old one having become in a decayed and worn-out condition.

The new slide is 426 feet in length and 3 feet, 4 inches in width at the bottom, with sides battering out 9 inches to the foot, the average height of the sides being about 4 feet. The upper end, for a length of 30 feet, is built of 12x16-inch hemlock timber, the remaining portion, 396 feet in length, with framed

bents placed about 4 feet apart from centres and resting upon 12x12-inch hemlock stringers. The bents are constructed with 8x10-inch hemlock sills, and 6x6-inch pine posts and braces. The flooring is of birch and maple, 4 inches in thickness, and the sides are formed with 3-inch pine planking, the whole being secured with 7 and 8-inch wrought iron spikes.

Bob Lake Dam and Slide.

The timber in the back of this dam, for a length of 64 feet and a height of 4 feet, has been renewed and the remaining portion, 46 feet in length, has been provided with two 12-inch courses. The top of the dam has also been covered with hardwood planking, 4 inches in thickness, securely spiked to 10x12-inch stringers with 8-inch wrought iron spikes, and considerable repairs have also been made to the flooring of the slide.

Workman's Dam and Slide.

This slide has been supplied with four new floor sills, and the flooring has been renewed for a length of 45 feet and a width of 20 feet with maple and birch planking, 6 inches in thickness, the planking being secured with $\frac{3}{4}$-inch wrought iron rag spikes. The old planking in the slide has also been re-spiked.

Horse Shoe Lake Dam.

This dam has been gravelled and supplied with six new stop-logs, and the waste sluice at the southerly end, 36 feet in width, has been replanked with 3-inch pine planking.

Hawk Lake Dam and Slide.

This slide has been extended 40 feet in length. The foundation is of crib-work, 14 feet in width and 8 feet in height, the flooring is of flatted hardwood, and the sides are formed with 12x12-inch square timber. Repairs have also been made to the flooring of the old slide, immediately below the stop-logs.

Grace Lake Dam.

The stop-log platform and also the waste sluice at the westerly end of this dam has been replanked with 3-inch pine planking, and four new stop-logs and four new windlass frames have been provided. Repairs have also been made to the planking of the apron, some additional stone filling put in the two centre piers and the dam gravelled to stop leakage.

Young's Point Lock.

Some obstructions have been removed from the chamber and repairs have been made to the valve gearing, the departmental diving apparatus being utilized in the carrying out of the work.

Lindsay Swing Bridges.

The reconstruction of two swing bridges, one on Wellington street in Lindsay, and the other a short distance south of the town, in the township of Ops, was commenced in the latter part of April and continued until the middle of June, when the work, with the exception of painting, was completed. The painting was not attended to until the latter part of September, the work being allowed to stand in order to give the timber a chance to become seasoned.

During the carrying out of the work temporary arrangements were made for the accommodation of foot passengers, and as both the bridges were framed

and made ready to be put together before the old structures were interfered with, public travel suffered very little inconvenience and navigation was not at all impeded.

The foundation timbers of both bridges have been renewed with 12x12-inch square pine, and the spaces between the timbers on the bridge south of Lindsay have been filled with Portland cement concrete. The easterly pier of the Wellington street bridge has been rebuilt from the water up, a height of 4 feet, with 12x12-inch square timber, and two framed bents with a platform on top have also been provided to receive the approach and the end of the swing bridge.

Guide booms have been provided and placed on each side of the river above the bridge, the one on the easterly side being 113 and the one on the westerly side 130 feet in length. The booms are 2 feet, six inches in width, constructed of 2x12-inch pine plank well spiked together and bolted every 10 feet with $\frac{7}{8}$-inch wrought iron bolts. The upper ends of the booms are secured to crib-work piers, 6x9 feet square, built of 12x12-inch timber, and the lower ends are supported by the bridge piers.

The bridge on Lindsay street has been provided with two new wheels for the turn-table, and has also been painted, and one new wheel has been provided for the bridge south of the town.

The following are the lockmaster's returns of the lockages made at the different locks during the year:

Port Carling Lock.—1,742 steamers, 1,290 small boats, 686 scows and 327 cribs of timber.

Mary's and Fairy Lakes Lock.—139 steamers, 74 scows and 22 cribs of timber.

Magnetawan Lock.—615 steamers, 26 small boats, 64 scows and 9 cribs of timber.

Lindsay Lock.—153 steamers, 142 scows and 208 cribs of timber.

Young's Point Lock.—1,093 steamers, 65 small boats, 244 scows and 195 cribs of timber.

Balsam River Lock.—140 steamers, 180 scows and 31 cribs of timber.

EXTENSION OF RAILWAYS IN 1892.

The details of the work done on the several new lines of railway during the present year are as far as could be ascertained as follows:—

Toronto Belt Line Railway.

The construction of this railway was commenced in the month of April, 1890, and continued until the close of 1891, when, as previously reported, the line was practically completed. It was not, however, opened for traffic until the 30th of August of the present year, and is operated by the Grand Trunk

The Parry Sound Colonization Railway.

Construction work was continued on this railway until the latter part of July of the present year, when the line was completed to a point 20 miles westward from its commencement at Scotia on the Northern and Pacific Junction Railway. Since then I understand no work of any consequence has been done, but I am informed operations will be vigorously prosecuted during the coming year, and it is expected the line will be completed to Parry Sound about the close of 1894, when it will form and be operated as a portion of the Ottawa, Arnprior and Parry Sound Railway.

Ottawa, Arnprior and Parry Sound Railway.

This railway is intended to extend from Ottawa to Parry Sound, the total length being about 253 miles, the Parry Sound Colonization Railway, as above stated, about 50 miles in length, forming a portion of the line.

Construction was commenced at Ottawa in July of the present year, and the work has been so vigorously prosecuted that I understand the grading is now completed to Arnprior, a distance of 35 miles, and that 20 miles of track have been laid. The ballasting I understand will be attended to as early as possible in the spring, and it is expected that a total length of 85 miles will be completed before the close of the coming year.

I am also informed that the line is to be built in the most substantial manner, with steel bridges and first-class masonary sub-structures, and that the grades and curves will both be easy, the whole being designed with a view to the conveyance of heavy traffic.

Irondale, Bancroft and Ottawa Railway.

The construction of this railway, as previously reported, was commenced in the month of October, 1886, and the line was completed and opened for traffic to Irondale, a distance of 10 miles, in the early part of the following year. Operations have been resumed during the present year, and I understand that the grading and bridging of another 10 miles has been completed, and the ties also distributed, the line being now ready to receive the rails.

Port Arthur, Duluth and Western Railway.

The construction of this railway has been continued during the present year, and the work has been so vigorously prosecuted that the line has not only been completed to the International boundary at the westerly end of Gun Flint Lake, but has been continued beyond for a distance, I understand, of about 6 miles, to an iron mine, in the State of Minnesota, from which it is expected large quantities of ore will be hauled to Port Arthur for shipment.

The total length of the line in Ontario is 85.54 miles, the greater portion of which passes through a district rich in both minerals and timber, but still unsettled, which section of country it will without a doubt materially assist in opening up and developing.

Atlantic and North West Railway.

This railway is intended to extend from the Village of Renfrew to a point at or near Parry Sound, thence to a point on the east side of Lake Superior, the distance from Renfrew to Parry Sound being about 195 miles.

The construction of the line was commenced during the present year, at a point on the Canadian Pacific Railway, about 3 miles west of Renfrew, and I understand it is now completed, and will be at once opened for traffic to Eganville, a distance of 19¼ miles.

The location survey west of Eganville is, I am informed, about completed as far as the valley of the Madawasca, near the line between the Townships of Jones and Lyell.

The following statement revised to the close of 1892 gives in detail the mileage of each railway in Ontario, distinguishing between those constructed prior to and since Confederation.

REVISED STATEMENT.

No.	Name of Railway.	Terminal Points.		Completed prior to Confederation.	Completed since Confederation.	At present under Construction or Contract.
		From.	To.	Length in Miles.	Length in Miles.	Length in Miles.
1	Grand Trunk Railway, Main Line	Eastern Province Boundary.	Point Edward	457		
2	do Buffalo & Lake Huron Branch	Fort Erie	Goderich	158		
3	do London Branch	St. Mary's	London	23		
4	do Galt & Doon Branch	Galt	Berlin	7	4.5	
5	do Waterloo Junction Railway	Waterloo	Elmira		10.25	
6	do Toronto & Nipissing Branch	Toronto	Coboconk		88	
7	do Midland Railway, Main Line	Port Hope	Midland City	65	54.53	
8	do do Peterboro' Branch	Millbrook	Lakefield	13	9	
9	do Lake Simcoe Junction	Stouffville	Jackson's Point		26.5	
10	do Whitby, Port Perry & Lindsay	Whitby	Lindsay		46	
11	do Victoria Railway	Lindsay	Haliburton		55.81	
12	do Grand Junction Railway	Belleville	Peterborough		64.65	
13	do Belleville & North Hastings	Grand Junction Railway	Madoc		22	
14	do Toronto & Ottawa, Main Line	Peterborough	Casselman		9	173
15	do do Manilla Link	Wick	Manilla		6.5	
16	do do Omemee Link	Omemee	Peterborough		14	
17	do Port Dover and Lake Huron	Port Dover	Stratford		63	
18	do South Norfolk Railway	Simcoe	Port Rowan		17	
19	do Chemong Branch	Peterborough	Chemong Lake		9	
20	do Stratford and Huron	Stratford	Wiarton		106.27	
21	do Owen Sound Extension	Parkhead	Owen Sound			13.50
22	do Georgian Bay & Wellington	Palmerston	Durham		26	
23	Grand Trunk Railway, Great Western Div., Main Line	Suspension Bridge	Windsor	229		
24	do Toronto & Hamilton Branch	Toronto	Hamilton	39.5		
25	do Loop Line Division	Glencoe	Fort Erie		145	
26	do Kingscourt & Glencoe Link	Kingscourt	Glencoe		20.60	
27	do Sarnia Branch	Komoka	Sarnia	51		
28	do Petrolea Branch	Wyoming	Petrolea	7		
29	do Brantford Branch	Harrisburg	Brantford	8		
30	do Brantford & Norfolk	Brantford	Tilsonburg		35.88	
31	do Wellington, Grey & Bruce	Harrisburg	Southampton	27	102	
32	do do S. Extension	Palmerston	Kincardine		66	
33	do London, Huron & Bruce	Hyde Park Junction	Wingham		69.75	
34	do London & Port Stanley	London	Port Stanley	25		

35	do Welland Railway	Port Colborne	Port Dalhousie	25		
36	Northern Railway, Collingwood Line	Toronto	Meaford	94	21	
37	do Muskoka Branch	Barrie	Gravenhurst		53	
38	do Hamilton & Northwestern, Main Line	Port Dover	Allandale		135.3	
39	do do Collingwood Branch	Clarksville	Collingwood		40	
40	do North Simcoe Junction	Colwell	Penetanguishene		33.34	
41	Northern & Pacific Junction Railway	Gravenhurst	La Vause		111.5	
42	Toronto Belt Line Railway, Easterly Section	Don Station, G.T.R.	Junction with Northern Ry.		8.50	
43	do do do Westerly do	Carlton on G.T.R.	Swansea		4.33	
44	Canadian Pacific Railway, Main Line	Ottawa	Western Province Boundary	57	1144	
45	do Algoma Branch	Sudbury Junction	Sault Ste. Marie		180.25	
46	do Brockville & Ottawa Railway	Brockville	Carleton Place	46		
47	do St. Lawrence & Ottawa Ry. and Chaudiere Branch	Prescott	Ottawa	59.5		
48	do Ontario & Quebec Railway	Toronto Junction	Eastern Province Boundary	12	281.25	
49	do do Don Branch	Main Line	Toronto		5	
50	do do Detroit Ex ension	London	Windsor		112.50	
51	do Credit Valley Ry., Main Line	Toronto	St. Thomas		119.13	
52	do do Orangeville Branch	Streetsville	Elora and Orangeville		62.83	
53	do do Guelph Branch	Campbellville	Guelph		15	
54	do Toronto, Grey & Bruce, Main Line	Toronto	Owen Sound		122	
55	do do Teeswater Branch	Orangeville	Teeswater		73	
56	do do Wingham Branch	Glenannan	Wingham		4.75	
57	do West Ontario Pacific Railway	Woodstock	London		27	
58	do South do	Toronto	Hamilton			40
59	Canada Southern Railway, Main Line	Fort Erie	Amherstburg		229	
60	do St. Clair Branch	St. Thomas	Courtwright		62	
61	do Essex Cut-off	Essex Centre	Sandwich		15.5	
62	do Niagara Branch	Niagara	Fort Erie	30		
63	Canada Atlantic Railway	Ottawa	Eastern Province Boundary		68.08	
64	Cobourg, Peterborough & Marmora Ry., Marmora Line	Cobourg	Harwood	22		
65	Kingston & Pembroke Railway	Kingston	Renfrew		103	
66	Prince Edward County Railway	Picton	Trenton at G. T. R		32.44	
67	Central Ontario Railway	Trenton at G. T. R	Coe Hill		74	
68	Erie & Huron Railway	Rondeau	Sarnia		70.47	
69	Napanee, Tamworth & Quebec Railway	Napanee	Tweed		50	
70	do do Harrowsmith Branch	Yarker	Harrowsmith		7	
71	Bay of Quinte Railway	Deseronto	Grand Trunk Railway		3.5	
72	Nosbonsing & Nipissing Railway	Lake Nipissing (S. E. Bay).	Lake Nosbonsing		5	
73	Ontario & Sault Ste. Marie Railway	Sault Ste. Marie	Spanish River			125
74	Irondale, Bancroft & Ottawa Railway	Kinmount	Bancroft		10	40
75	Brockville, Westport & Sault Ste. Marie	Brockville	Sault St. Marie		45	455
76	St Catharines & Niagara Central Railway	Niagara Falls	Toronto		12.5	62.5
77	Lake Erie, Essex & Detroit River Railway	Walkerville	Leamington		38	
78	Port Arthur, Duluth & Western Railway	Port Arthur	Gun Flint Lake		85.54	
79	Parry Sound Colonization Railway	Scotia	Parry Sound		20	29
80	Ottawa, Arnprior & Parry Sound Railway	Ottawa	Scotia			203
81	Atlantic & North-West Railway	Renfrew	Parry Sound		19.25	175.75
				1,455.00	4,575.20	1,316.75

It will be seen from the foregoing details that construction work has been in progress on five new lines of railway, two of which have been commenced during the present year.

The improvement of the Grand Trunk system has also been continued, and I understand that on the Western Division a link has been constructed from Kingscourt on the Sarnia Branch to Glencoe on the main line, a distance of 20.60 miles, and that 2.10 miles of double track have been laid on the Toronto Branch between Waterdown and the Junction Cut. On the main line between Toronto and Montreal 7.45 miles of double track have been laid between Scarborough Junction and Port Union, and 21.20 miles between Graft onand Trenton

I have the honour to remain, sir,

Your obedient servant,

ROB'T McCALLUM,

Engineer Public Works.

STATEMENTS

OF THE

ACCOUNTANT

AND

LAW CLERK.

STATEMENT No. 1.

Being Statement of Expenditures (under authority of 43 Vic. Cap. 2, and amending Acts, 48 Vic. Cap. 6, 50 Vic. Cap. 3; and 54 Vic. Cap. 4,) on account of erection and construction of the new Parliament and Departmental Buildings, and shewing (1) the total of such expenditure to the 31st December, 1891; (2) the additional expenditure for the year 1892; and (3) the grand total of expenditure to 31st December, 1892.

NOTE.—For miscellaneous expenditures in respect of grading, filling up and laying out of grounds, etc., making of roads and pavements, etc., and equipment, furnishing and fitting up, etc., of the buildings, see Statement No. 2. For preliminary expenditures in respect of competitive plans, etc., see Note B, at foot of this statement.

To Whom Paid.	For what Work, etc.	Expenditures to 31st December, 1891.	Additional Expenditures for Year 1892.	Grand Total of Expenditures to 31st December, 1892.
		$ c.	$ c.	$ c.
Lionel Yorke Carroll, Gaylord & Vick	Excavating, concreting, masonry, brickwork, etc.	260,320 77 307,884 99	..... 83,291 54	651,497 30
Lionel Yorke	Bricks not supplied by Central Prison (see Note A)	12,037 05	.....	12,037 05
Central Prison	Bricks furnished contractors (see Note A)	30,000 00	.....	30,000 00
Lionel Yorke	Iron work, etc., ground floor and basement of west wing	4,643 00	.....	4,643 00
Lionel Yorke Margaret Yorke, Administratrix, etc.	Carpenter work, etc., other than ground floor and basement of west wing	4,062 53 44,944 48	..... 27,198 88	76,205 89
St. Lawrence Foundry Co	Iron work, etc	39,575 92	7,461 92	47,037 84
A. H. Rundle	Plastering, etc	9,315 02	24,190 30	33,505 32
Purdy, Mansell & Mashinter	Plumbing, steamheating, etc	15,595 90	47,787 07	63,382 97
Douglas Bros	Slate and copper roofing, etc	24,724 04	18,007 49	42,731 53
Wagner, Zeidler & Co	Interior wood work, etc	1,538 33	64,523 53	66,061 86
R. J. Hovenden	" painting, glazing, etc	.....	18,203 12	18,203 12
H. C. Harrower	Grand stair case, grille work, etc	.....	16,898 51	16,898 51
Garson & Purcer	Outer drainage, etc	.....	4,761 01	4,761 01
Wm. J. McGuire & Co	Interior fire hydrants, piping, etc	.....	1,102 70	1,102 70
Mr. R. A. Waite	Payment of architect's fees	24,000 00	9,500 00	33,500 00
Sundry other expenditures	*Re* water mains, drains, advertising tenders, etc	5,745 97	286 10	6,032 07
	Totals	784,388 00	323,212 17	1,107,600 17

NOTE A.—By the terms of the original contract for excavating, concreting, masonry, brickwork, etc., approved of by the Provincial Legislature, the contractor was to receive (1) $671,250, and (2) thirteen and one-half million of brick from the Central Prison. If less than this amount of brick was supplied from the Central Prison he was to be paid at the rate of six dollars per thousand for the difference between the quantity supplied and said thirteen and one-half millions. The actual quantity of brick supplied from the Central Prison to the contractors was only 10,454,450.

NOTE B.—The preliminary expenditures for and in connection with the competitive and other plans, etc., prior to those prepared by Mr. Waite, and which preliminary expenditure amounted to a total of $17,876.76, are omitted from this statement, as they form no part of the actual cost of the erection and construction of these buildings under Mr. Waite's plans.

PUBLIC WORKS DEPARTMENT, ONTARIO,
TORONTO, *January*, 1893.

J. P. EDWARDS, *Accountant*,
Public Works Department.

STATEMENT No. 2.

Shewing miscellaneous expenditures (*a*) to 31st December, 1891; (*b*) for the year 1892; and (*c*) the grand total of such expenditures to 31st December, 1892, in connection with the New Parliament and Departmental Buildings for (1) Old Hospital premises; (2) Outside fire hydrants, water mains for grounds, etc.; (3) Grading, levelling, filling up and laying out of the grounds and making of roads, pavements, etc.; (4) Equipping, furnishing and fitting up the buildings with passenger elevators, combination electric and gas fittings, and interior wiring for electric power and lighting; (5) Book stacks, shelving, reading desks, tables, etc., for library, members' reading-room, etc.; (6) Metal files, pigeon holes, and other fittings for vaults, offices, etc.; and (7) Such additional fittings, furnishings, equipment and other matters as are not included in the statement of expenditures for the erection and construction of these buildings.

NOTE—*For expenditures in respect of the erection and construction of the buildings, see Statement No. 1.*

To whom paid.	For what paid.	Expenditure to 31st December, 1891.	Expenditures 31st December, 1892.	Grand Total.
		$ c.	$ c.	$ c.
Toronto University	Old Hospital premises	30,000 00		
Bennett & Wright	Combination electric and gas light fittings		3,685 95	
Otis Bros. & Co	Electric elevators		7,520 00	
Office Specialty Co.	Vault files, pigeon holes, etc		3,470 00	
Wm. Simpson	Book stacks, tables, reading desks, etc., for library, reading-room, etc		2,583 00	
Conger Coal Co	Coal and wood		609 40	
M. Donnelly	"		146 70	
Consumers' Gas Co	Coke		77 15	
Toronto Fire Department	Fire alarm box		149 60	
Andrew Jeffrey	Copperas		50	
O. Tolliver	Whitewashing vaults, etc		36 00	
Stewart & Wood	Paint for vault floors		55 80	
A. Williams	Use of plow in grounds		1 50	
Water Works Department	Outside fire hydrants, etc		3,105 18	
Purdy, Mansell & Mashinter	Hose couplings, etc		103 30	
Grand Trunk Railway	Freight		5 72	
Oakley & Holmes	Materials for pavements, roads, concrete, etc		4 00	
Carroll & Vick	" "		1,836 62	
Frederick McKeown	" "		1,696 28	

James Maloney	Material for pavements, roads, concrete, etc.			713 63
Walter Page	" "			5 63
Wm. Best & Co	" "			32 00
J. B. Smith & Sons	" "			205 89
E. Hivans	" "			24 11
Geo. B. Meadows	" "			28 50
Wm. Harrison	" "			238 50
Britnell & Co	" "			1,248 96
John Hurst	" "			16 40
John Hearne	" "			84 24
S. Hallett	" "			1 88
Wm. Maguire	" "			2,883 75
St. Lawrence Foundry Co	Iron cover plates, etc			85 31
Bertram & Co	Tools,, hardware, etc.			1 70
G. Crow	"			4 44
G. Forrest	"			10 70
Rice Lewis & Son (Ltd.)	"			51 11
James Oug	"			9 45
Wm. Rosebrugh & Sons	"			334 05
S. Rogers & Co	Oil, etc			12 78
N. L. Piper & Son	"			17 05
Toronto Incan. Elec. Light Co	Material for electric light and power wiring, etc			190 90
Canadian Elec. Light Co	" "			240 56
Royal Electric Co	" "			190 59
Toronto Electrical Works	" "			128 88
J. A. Kammerer	" "			241 58
Bennett & Wright	" "			4,144 63
Withrow & Hillock	" "			446 62
James Scott	" "			30 83
Pay lists of men	Work on roads, pavements, grounds, electric wiring, etc			8,059 28
	Totals	30,000 00	44,770 65	74,770 65

NOTE—This statement does not embrace (1) The expenditure of $17,876.76 for and in connection with the competitive and other plans, etc., submitted prior to those prepared and designed by Mr. Waite, as to which latter expenditures, see note "B" to Statement No. 1; nor (2) the expenditure of $1,258.06 in connection with the sale of lands set apart by Act to form New Parliament Buildings Fund. The amount realized from the sale of these lands to 31st December, 1892, was $174,210.04.

PUBLIC WORKS DEPARTMENT, ONTARIO,
TORONTO, January, 1893.

J. P. EDWARDS, *Accountant*,
Public Works Department.

STATEMENT No. 3.

Being Statement of Expenditures on Capital Account in 1892, and total of expenditures up to the 31st December, 1892, on public buildings and works other than the new Parliament and Departmental Buildings.

NOTE—*For new Parliament and Departmental Buildings see Statements Nos. 1 and 2.*

Name of Work.	Expenditures from 1st July, 1867, to 31st December, 1891.	Expenditures, 1892.	Totals.
	$ c.	$ c.	$ c.
Government House	171,411 97	673 98	172,085 95
Old Parliament and Departmental Buildings	85,285 98		85,285 98
Asylum for the Insane, Toronto	307,947 85	10,682 09	318,629 94
" Mimico	459,886 88	57,977 63	517,864 51
" Brockville		20,438 58	20,438 58
" London	789,623 63	31,904 30	821,527 93
" Hamilton	726,957 80	39,839 03	766,796 83
" Kingston	343,273 09	20,656 15	363,929 24
" " (Branch)	9,422 82		9,422 82
Asylum for Idiots, Orillia	479,842 34	3,584 06	483,426 40
Deaf and Dumb Institution, Belleville	258,383 85	16,953 85	275,337 70
Blind Institution, Brantford	244,055 28	10,479 73	254,535 01
Reformatory for Boys, Penetanguishene	153,981 22	6,196 36	160,177 58
Agricultural College, Guelph	367,762 96	27,156 76	394,919 72
Central Prison, Toronto	692,806 57	46,915 45	739,722 02
School of Practical Science, Toronto (old building)	59,100 26		59,100 26
" " (new building and addition)	176,395 46	10,808 97	187,204 43
Andrew Mercer Reformatory for Females, Toronto	199,456 66	3,018 83	202,475 49
Osgoode Hall, Toronto	128,773 32	275 80	129,049 12
Agricultural Hall, Toronto	324 00		324 00
Educational Department and Normal and Model Schools, Toronto	130,808 34	7,173 50	137,981 84
Normal and Model Schools, Ottawa	172,983 95	22,496 14	195,480 09
Government Farm, Mimico	51,646 34		51,646 34
Brock's Monument, Queenston Heights	3,841 01		3,841 01
Niagara River Fence	8,025 43		8,025 43
Muskoka District—Immigration Sheds at Gravenhurst	355 00		355 00
" Registry Office and Lock-up, Bracebridge	8,281 22	1,869 18	10,150 40
" Lock-up and Court Room at Huntsville	7,570 67	403 80	7,974 47
Algoma District—Court House, Gaol and Registry Office, etc., Sault Ste. Marie	22,935 37	63 00	22,998 37
" Grand Manitoulin Island—Three Lock-ups (Gore Bay, Little Current and Manitowaning)	15,371 79	160 24	15,532 03
" Lock-up at Killarney	1,292 97		1,292 97
" " Bruce Mines	3,117 48		3,117 48

" " Thessalon	1,183 79		1,183 79
Thunder Bay District—Registry Office and Lock-up, addition to Gaol and Court House, etc., Port Arthur	36,722 97	140 69	36,863 66
" Lock-up at Fort William	7,597 58	20 00	7,617 58
" " Silver Islet, Lake Superior	2,304 79		2,304 79
Parry Sound District—Registry Office, Lock-up, etc., Parry Sound	17,111 99	102 86	17,214 85
" Lock-up at Maganetawan	631 40	14 16	645 56
" " and Court Room at Burk's Falls	5,628 56	499 76	6,128 32
" " at French River		1,098 77	1,098 77
Nipissing District—Lock-up at Mattawa	3,283 41		3,283 41
" " and Court Room at North Bay	15,676 34	307 80	15,983 64
" Registry Office at North Bay	2,789 95		2,789 95
" Lock up at Sudbury	2,981 34	5,084 30	8,065 64
Rainy River District—Lock-up, Court Room and Gaoler's Residence, New Registry Office, etc., at Rat Portage	23,313 50	239 04	23,552 54
" Lock-up, Fort Francis	56 00	1,964 18	2,020 18
County of Haliburton—Registry Office at Minden	4,000 47		4,000 47
Lock at Young's Point	31,192 72		31,192 72
" at Balsam and Cameron Lakes	23,959 02		23,959 02
" and Works, Mary's and Fairy Lakes	63,501 07		63,501 07
Maganetawan Works—Lock, Dam and River Improvements, and Dam and Slide at Deer Lake	52,475 94	2,814 41	55,290 35
Georgian Bay Works	5,085 37		5,085 37
Landing Pier at Port Elgin	1,000 00	750 00	1,750 00
Landing Pier at Southampton	1,300 00		1,300 00
Muskoka Lakes Works	10,713 37		10,713 37
" Lock and Bridges at Port Carling	42,606 04		42,606 04
" Cut and Bridges at Port Sandfield	16,842 86		16,842 86
" Muskoka Falls Works and Bridge at Bala	7,223 96		7,223 96
Nipissing Lake Works	9,182 17		9,182 17
Couchiching Lake Works	427 84		427 84
Mud Lake Works (Township of Dalton)	1,502 32		1,502 32
Kushog Lake Dam	300 00		300 00
Mississicua Lake Dam	4,989 84		4,989 84
Lake of Bays—Dredging mouth of river at outlet of	581 82		581 82
Peninsula Creek Improvement	25,088 86	348 22	25,437 08
Stoney Creek Works (Township of Op)	828 25		828 25
Scugog Lake Works—Dredging at Port Perry	977 53		977 53
Lake Scugog—Flats Road	1,500 00		1,500 00
Gull and Burnt River Works	72,971 14	500 31	73,471 45
Muskoka River Works	38,198 93		38,198 93
Sydenham "	2,156 26		2,156 26
Nottawasaga "	5,915 09		5,915 09
Kaministiquia "	22,865 02		22,865 02
Scugog " (including Lindsay Lock and Swing Bridges)	92,290 03		92,290 03
Pigeon "	4,999 62		4,999 62
Otonabee "	7,266 66		7,266 66
Balsam "	15,592 95	992 16	16,585 11
Wye "	5,176 98		5,176 98
Nation "	10,877 23	3,000 00	13,877 23
Beaudette " (to aid Dredging, etc.)	3,000 00		3,000 00
Mississippi River Improvements (below Carleton Place)	2,877 39		2,877 39

STATEMENT No. 3—*Concluded.*

Being Statement of Expenditures on Capital Account in 1892, etc.

Name of Work.	Expenditure from 1st July, 1867, to 31st December, 1891.	Expenditures, 1892.	Totals.
	$ c.	$ c.	$ c.
Head River Improvements (Townships of Laxton and Carden)	976 82		976 82
Moira " (Township of Thurlow)	2,135 22		2,135 22
Trent River Bridge	2,000 00		2,000 00
Washago and Gravenhurst Road	32,792 12		32,792 12
" Wharf	489 22		489 22
Portage du Fort Bridge	5,247 99		5,247 99
Des Joachim's Rapids—Bridge and Approaches	5,937 72		5,937 72
Surveys, Inspections, Arbitrations and Awards	43,691 89	228 98	43,920 87
Maintenance of Locks, Dams, Slides, Bridges, etc	85,919 56	9,289 67	95,209 23
Roads in Township of Ryerson	7,295 06		7,295 06
Clearing and Log Houses on Free Grant Lands (Settlers' Homestead Fund)	16,780 75		16,780 75
Aldborough Drainage Works	7,199 02		
Brooke "	34,747 73		
Delaware "	5,740 93		
Dunwich "	10,105 86		
Ekfrid, Caradoc and Metcalf Drainage Works	13,667 66		
Grey Drainage Works	8,175 47		
Moore "	17,091 58		
Mosa "	12,714 75		
Nissouri West Drainage Works	8,178 50		364,829 44
Raleigh "	36,409 64		
Russell "	11,543 77		
Sarnia "	40,540 55		
Sombra "	53,169 04		
Tilbury, East "	35,297 62		
" West "	31,577 06		
Williams, East "	2,221 75		
Surveys and Drainage of Swamp Lands (Provincial Account)	36,448 51		
Totals	7,357,765 67	367,122 24	7,724,887 91

PUBLIC WORKS DEPARTMENT, ONTARIO,
TORONTO, *January*, 1893.

J. P. EDWARDS, *Accountant*,
Public Works Department.

STATEMENT No. 4.

Contracts, Bonds, etc., entered into with Her Majesty during 1892.

Date.	Service.	Subject of Contract.	Contractor.	Sureties.	—	Amount.
						$ c.
1892. Feby. 24..	Maintenance of locks and dams, etc.	Timber for two new swing bridges, Lindsay.	Sadler, Dundas & Company, of Lindsay.	None	White pine timber, per M. ft. board measure ... White oak timber per M. ft., board measure	16 50 30 00
Mar. 3..	Education Department and Normal and Model Schools, Toronto.	Decorating interior of Assembly Hall.	Elliott & Son, of Toronto ..	None		1,500 00
May 4..	Education Department and Normal and Model Schools, Toronto.	Wrought iron fence round grounds.	Russell G. Olmstead, of Hamilton.	John E. Riddell and James Skinner, both of Hamilton.		4,377 60
June 4..	Agricultural College, Guelph.	Reconstruction and repairs of water closets, baths, sinks, etc.	Keith & Fitzsmons, of Toronto.	None		460 00
June 9..	Equipment of new Parliament and Departmental Buildings, Toronto.	Electric engine and passenger elevator, and fittings, etc., in connection therewith for easterly wing.	Otis Brothers & Co., of New York City, U.S.A.	None		5,500 00
June 10..	Asylum for the Insane, London.	Erection of annexes for dining-rooms in rear of wing.	John Purdom, of London ...	Thomas H. Purdom and Alexander Purdom, both of London.		19,975 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agent's Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Went-worth.	1	594	26977 20	30	1557 43	64	338 78	8113 99	8033 51	419 26	60	2	1	2	7 00	....	28 72	66 00	5	26 00
	2	120	4430 14	4	257 01	13	45 44	1457 16	1469 19	33 41	11	....	....	1	5 00	....	5 08	....	....	....
	3	58	1323 75	6	362 27	5	....	597 68	561 11	36 57	1	....	....	....	....	....	....	....	....	....
	4	69	2570 54	7	242 98	3	48 93	1437 77	1450 20	36 50	3	2	....	2	11 00	....	2 13	....	....	....
	5	26	767 33	....	....	....	....	517 24	517 24	....	1	....	....	1	....	....	77	....	....	....
	6	19	870 81	8	286 46	1	55 91	268 67	290 13	31 45	1	....	....	....	....	....	83	....	....	....
	7	14	406 28	1	86 42	3	....	322 92	314 92	8 00	....	....	....	1	11 00	1	24	....	....	....
	8	21	764 12	3	121 32	5	....	451 59	451 59	....	3	....	....	....	....	....	99	....	....	....
	9	574	26401 47	23	1067 86	13	998 92	7848 52	8088 61	758 63	67	5	....	1	10 00	....	28 09	88 20	2	10 00
York	1	2637	140784 05	57	3848 77	750	312 07	22193 97	20930 23	1263 00	327	9	3	2	21 00	....	138 43	1743 87	17	48 00
	2	202	8211 15	19	1192 95	60	155 77	2503 95	2546 24	113 48	17	....	....	....	....	....	8 57	....	....	....
	3	68	2754 26	7	126 41	11	109 53	1378 36	1438 67	49 22	8	1	....	....	....	....	3 14	....	....	....
	4	248	10320 65	13	745 22	64	679 18	4186 60	4789 37	76 41	26	5	1	1	12 00	....	11 78	....	....	....
	5	161	2878 96	21	1372 78	5	310 65	2259 58	2119 06	451 17	16	....	....	1	12 00	....	6 97	....	1	5 00
	6	166	8565 46	14	817 79	17	48 80	2981 14	2915 62	65 52	30	....	....	....	....	....	10 44	....	1	5 00
	7	97	3099 14	11	471 09	22	18 75	1600 14	1587 14	31 75	7	1	....	2	24 00	....	3 31	....	....	....
	8	258	11722 90	30	2086 69	50	85 50	3262 16	2801 77	460 39	33	1	....	2	23 00	....	13 11	....	1	10 00
	9	69	2957 44	2	142 15	17	53 25	987 87	1014 42	26 70	6	....	....	....	....	....	2 88	....	....	....
	10	3516	194638 26	90	5960 62	1029	1 08	24375 22	23776 83	598 39	512	....	....	7	70 00	....	204 17	2305 31	23	89 00

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties, or District.	Number of Divisions.	Number of Suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	Amount of costs so taxed.
Brought forward.	302	44112	1671187 84	3655	183942 94	7410	28587 25	609723 17	605420 42	34210 99	3210	270	82	174	1803 50	23	1541 04	2661 68	294	1783 00
Wentworth..	9	1495	64511 64	82	3981 75	137	1487 98	21015 54	21176 50	1326 82	147	9	3	7	44 00	1	67 82	154 20	7	36 00
York	10	7422	385932 27	264	16764 47	2025	1881 50	65728 99	63919 35	3136 03	982	17	8	15	162 00		402 80	4049 18	43	157 00
Carried forward.	321	53029	2121631 75	4001	204689 16	9572	31956 73	696467 70	690516 27	38673 84	4339	296	93	196	2009 50	24	2011 66	6865 06	344	1976 00

No. 4.—Contract, Bonds, etc., entered into with Her Majesty during 1892.—*Continued.*

Date.	Service.	Subject of Contract.	Contractorr.	Sureties.	——	Amount.
1892						$ c.
Sept. 22..	Normal and Model Schools, Ottawa.	Wood, 1892-3	John Heney, of Ottawa	None	Hardwood, per cord	4 75
					Pine wood, per cord	3 00
Sept.22 ..	Normal and Model Schools, Ottawa.	Coal, 1892-3	J. G. Butterworth & Co., of Ottawa.	....	Large egg or grate coal, per ton	5 91
Sept. 23..	Equipment of New Parliament and Departmental Buildings, Toronto.	Book stacks, shelving, tables, reading desks, etc., for Members' Library and Members' Reading Room.	William Simpson, of Toronto.	Thomas Douglas and Richard J. Hovenden, both of Toronto	.....	5,199 00
Sept. 26..	Construction of new Parliament and Departmental Buildings, Toronto.	Slate and marble floor tiling, etc., for entrance vestibules, lobbies, etc.	The Toronto Granite Co., Limited, of Toronto.	Alonzo W. Anderson, of Toronto, and Elias Van Zant, of Flesherton.	....	1,450 00
Sept. 28..	Asylum for the Insane, London.	Construction of a cottage for storekeeper (or butcher).	John Purdom, of London ...	Thomas H. Purdom and Alexander Purdom, both of London.	....	2,295 00
Sept. 28..	District of Nipissing, (lock-up at Sudbury.)	Construction of an addition, fencing, etc.	Robert Burdett, of Collingwood.	William Fryer and John Wilson, both of Collingwood.	....	6,347 00
Sept. 28..	District of Muskoka, (lock-up at Bracebridge).	Construction of an addition to the lock-up.	James Craig, of Barrie.....	George Ball and James S. Johnston, both of Barrie.	....	1,898 00

Oct. 1..	Equipment of new Parliament and Departmental Buildings, Toronto.	Combination gas and electric fittings, furnishings, etc., for Legislative Chamber and Main Southerly Entrance and Vestibule.	Bennett and Wright, of Toronto.	William G. Wright and Joseph H. Leech, both of Toronto.	.....	5,168 00
Oct. 3..	Construction of Asylum for the Insane, Brockville.	Construction of main and central buildings, kitchen, laundry, boiler house, coal vault and six cottages.	Garson, Purcer and Company, of St. Catharines.	Francis P. Begy and Patrick Larkin, both of St. Catharines.	.....	241,438 00
Oct. 6..	Equipment of new Parliament and Departmental Buildings, Toronto.	Metal fittings, etc., for eight vaults.	Office Specialty Manufacturing Co., of Toronto, etc.	None	.....	9,300 00
Oct. 20 ..	District of Parry Sound (Lock-up, French River).	Construction of lock-up, etc.	Adam and Broadbent, of Parry Sound.	Henry H. Wolton and Frank Dowell, both of Parry Sound.	.....	845 00
Nov. 18..	Construction of new Parliament and Departmental Buildings, Toronto.	Decorative painting, etc. of the ceilings, walls, etc., of the interior of the Legislative Chamber.	Elliott and Son, of Toronto..	Wallace J. Fischer and David T. McIntosh, both of Toronto.	.....	4,500 00
Nov. 19..	Construction of new Parliament and Departmental Buildings, Toronto.	Mantels, including mirrors, facings, linings, frames, hearths, borders, baskets, etc.	Rice Lewis & Son, Limited, of Toronto.	A. Burdette Lee and Samuel S. Martin, both of Toronto.	.....	3,322 00
Nov. 22..	Agricultural College, Guelph.	Erection of a piggery and of two greenhouses.	Frank J. Hough, of New Toronto.	John Ford, of New Toronto, and John D. Hough, of Mount St. Denis.	.....	4,436 00
Dec. 14..	Equipmentof new Parliament and Departmental Buildings, Toronto.	Cases, shelving, counter, fittings, etc., in Queen's Printer's apartments.	Moir and McCall, of Toronto	None	.....	700 00

No. 4.—Contracts, Bonds, etc., entered into with Her Majesty during 1892.—*Concluded.*

Date.	Service.	Subject of Contract.	Contractor.	Sureties	—	Amount.
1892						$ c.
Dec. 16	Institution for the Blind, Brantford.	Construction of a sewer to receive sewage of the Institution, and maintenance and repairs thereof in perpetuity.	The Corporation of the City of Brantford.	None		8,000 00
Dec. 17	District of Nipissing (re lock-up at Sudbury.)	Heating apparatus, etc., for lock-up.	Matthew C. Drew, of Burk's Falls.	None		650 00
Dec. 19	District of Muskoka (re lock-up at Bracebridge).	Heating apparatus, etc., for lock-up.	The E. and C. Gurney Co., Limited, of Toronto.	None		450 00
Dec. 19	Construction of new Parliament and Departmental Buildings, Toronto.	Seating, etc., for the ladies' and visitors' galleries in the Legislative Chamber.	The Charles Rogers & Sons Co., Limited, of Toronto.	James Stares and William R. Simmons, both of Toronto.		3,250 00
Dec. 20	Construction of new Parliament and Departmental Buildings, Toronto	Speaker's Dais, etc., in the Legislative Chamber.	Wagner, Zeidler & Co., of Toronto Junction.	Theodore A. Heintzman and Jacob P. Wagner, both of Toronto Junction.		920 00
Dec. 22	Equipment of new Parliament and Departmental Buildings, Toronto.	Hat and coat racks for members' coat room.	The Charles Rogers and Sons Co., Limited, of Toronto.	James Stares and William R. Simmons, both of Toronto.		1,535 00

PUBLIC WORKS DEPARTMENT, ONTARIO,
TORONTO, *January*, 1893.

J. P. EDWARDS, *Accountant and Law Clerk*,
Public Works Department.

FIFTH ANNUAL REPORTS

OF THE

INSPECTORS OF FACTORIES

FOR THE

PROVINCE OF ONTARIO

1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO
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1893.

FIFTH ANNUAL REPORTS

OF THE

INSPECTORS OF FACTORIES.

To His Honor the Lieutenant-Governor of Ontario :

The undersigned has the honor to transmit herewith the reports of the Inspectors of Factories for the year ending December 31, 1892.

Very respectfully submitted,

JOHN DRYDEN,
Minister of Agriculture.

FIFTH ANNUAL REPORTS

OF THE

INSPECTORS OF FACTORIES.

WESTERN DISTRICT.

To the Honorable the Minister of Agriculture

SIR,—I have the honor to submit the following Report of Factories' Inspection in the Western District of the Province for the year 1892.

During the year I have visited most of the more important factories in my district, many of them several times. On the whole, I found that the provisions of the Act were being very well carried out, and can but repeat what I have said in former reports, that for the most part employers were not only willing but anxious to conform strictly to the requirements of the Act. They admit that the law is a just one and serves a good purpose, more especially in those establishments where the proprietors are not abreast of the times in giving consideration to the health and welfare of their employees, or where the race for wealth or manufacturing existence urges employers to get all from their employees they can with the least possible outlay towards securing them any benefits.

There are quite a number of employers who, while they are not averse to the Factories' Act are not as ready as they should be to conform in some respects, especially if any considerable expense is to be involved. There are also those who, while they are willing to carry out my suggestions to an end do not accept my advice as to which is the better way as regards protection, ventilation, etc. In some instances where the suggestions have not been carried out in a manner to accomplish the end I have been compelled to insist on some further changes. In my visits through so large a number of factories I notice so many different appliances for conforming to the Act that I am able in most instances to advise as to what is likely to be most satisfactory.

VENTILATION.

Ventilation is receiving more attention than it did five years ago, and many and various plans for getting a better supply of pure air are now being adopted in the larger factories, though considerable yet remains to be done in the direction of removing dust from foundries. In connection with this subject is closely allied that of cleanliness, which, I am glad to say, is receiving more attention; also, I notice more scrubbing of floors and stairways, more whitewashing of walls and ceilings than formerly, and I trust this good work will be pushed with great vigor during the coming year in all factories, in view of the fact that the continent is quite likely to be afflicted with that dread plague, cholera, which is a filth disease, and thrives where cleanliness of body and surroundings are neglected.

Cleanliness and pure air are unfavorable to many other diseases besides cholera, and if, by restricted immigration and a strict quarantine, the scourge should be unable to obtain a foothold among us, the sanitary precautions will not have been in vain, for the improved working conditions of the factory operatives will bring adequate

results, among them immunity to a great extent from other diseases and better general health. This latter means more attention to their work, resulting in a greater production, without that carelessness which comes from the langour caused by bad sanitary conditions.

I am glad to be able to report that in the greater number of new factories erected during the last five years every consideration has been given to the health, safety and comfort of the operatives as to light and lighting, heating, ventilation, protection against fire, closets, guarding elevators and machinery, and in places where males and females both are employed separate closets, dressing and dining-rooms are provided. Some employers provide a stove for heating tea, some the tea, and others the milk and sugar as well. Some of the foregoing benefits are beyond the power of the Factories' Act to compel and are purely voluntary on the part of the employers, and as I have sometimes to allude in an unfavorable way to some of the omissions and commissions of the employers it is only fair that occasionally some of their good deeds should be noticed, at least in a general way. I also feel bound to mention that in factories where these voluntary benefits exist I have never had a word of complaint, nor have I heard of any troubles or disputes between these employers and their operatives, all going along smoothly and pleasantly, and so different from establishments where suspicion and ill-will prevail.

Accidents.

To the chapter of accidents, or, as it is called by some in England, the "butcher's bill," I have given the usual attention, making personal observation and investigation into such cases, as I thought possibly some protection might be provided to prevent a repetition under the same or similar circumstances. Of course a large number of those reported to me with particulars are such as render an investigation unnecessary, such as most of those happening from wood-working machinery, cleaning in motion, sticks flying, removing guard and omitting to replace it, and some others. I am pleased to be able to mention that employers are more in the way of reporting accidents than formerly and the majority are conforming to the law in this respect, as in fact I may say they are in all respects, so far as they understand what is required of them by the Factories' Act.

The accidents reported to me this year number 128, against 104 of last year and 95 in the previous year. In both of the previous years some accidents occurred, as I afterwards became aware of, that had not been reported, and it is probable that some may have happened this year that have not been made known to me. I am inclined to believe that as many employers have their operatives insured against liability under the "Workmen's Compensation for Injuries Act," and having to notify the insurance company when an accident takes place, some of them think they have conformed to the Factories' Act when they have done so, quite overlooking the fact that notice of an accident sent to the insurance company does not relieve them of their duty to notify the Factory Inspector. I have met with quite a number of cases of this kind. Again, there are some employers who are rather averse to reporting accidents to the Inspector, fearing such notice would be a basis for an action for compensation. In order to remove this impression I frequently take occasion to mention that the reporting of accidents to the Inspector has nothing to do with legal proceedings to recover damages for the person injured, but that where an Inspector receives notice of an accident he is to consider from the particulars given if a visit to the place of accident is necessary.

One might think that as all employers have had a copy of the Factories' Act that this law would be better understood, but occasionally an employer informs me that he has not read this Act, and some others do not clearly comprehend some of its clauses. Owing to this I receive quite a number of accident reports that are not accidents under the law. In such cases, though I do not enter them in my book, I acknowledge the receipt of the notices so as not to discourage them from reporting.

A portion of the increase of accidents this year over those of last year can be attributed to two very unfortunate occurrences, namely, the burning of the Strathroy Knitting Co's mills at Strathroy, on August 2nd, by which seven young women were

injured (some very seriously), in jumping from the fourth story of the burning building. The other calamity was the explosion of one of a pair of boilers in Force & Dickenson's stave mill at Staples, Essex county, on the morning of September 17th, whereby seven men were instantly killed and three others more or less scalded. These two misfortunes account for 17 most unexpected accidents.

As the Factory Inspectors of this province have no duties in connection with steam boilers, except on a complaint being made of a boiler being unsafe, (section 14), this class of accidents is not to any great extent prevented by the Factories' Act.

As to the burning of the mills at Strathroy, I may say that the building was of brick, 4 stories, 150 feet long, with two brick towers in front, each having a stairway and about 75 feet apart. In the generality of industries these would be sufficient exits, but when I found that from 50 to 65 females were working in the fourth or top flat, and carding and spinning of cotton was being carried on below them, and the cotton picker on the ground floor at the west end, and knowing the great liability of cotton to sudden ignition from a stone or other foreign substance in the cotton coming in contact with the steel teeth of the picker, I felt that some additional exit should be provided, and so ordered it in July, 1891. I received assurance from the son of the principal proprietor that it would be attended to. The manager of the mill was from home at the time, but I have it from himself that he received my order for the extra exit. On my visit to the scene of the fire on August 4th, I walked with him around the walls of the building to see what had been done in this respect, when, to my surprise, I found that no action had as yet been taken towards providing an additional exit. I asked why. He replied that he had given instructions to his machinist some days before to prepare and erect the exit. He then called the machinist over to us and he confirmed the statement. It is very unfortunate that the matter was delayed so long. I may mention that I had intended leaving home to visit this factory at noon of the very day that I received the news of the fire. So I went on as I had intended, but to a ruin instead of a fine mill in operation. Now, deducting the 17 accidents last referred to from the total of 128 reported, leaves 111 such accidents as ordinarily occur, or 2 more than last year; and allowing against this the better reporting of accidents, it leads to a safe inference that at least the number of accidents has not increased. I am of the opinion that the limit of accidents in my district—say about 110 annually—has been reached with the present number of employees.

Of course it is to be expected that the number of unpreventable accidents will increase in proportion as the number of operatives increase, yet I would repeat the assertion that so far as factory inspection can reduce the number of preventable accidents to a minimum it has done so in the Western District, and probably in the other districts as well.

By going carefully over my detailed list of accidents one might readily notice that very few of them are caused by non-conformity to the Factories' Act, or in any way that inspection can do much to prevent. In my whole list I find only eight accidents which inspection might have prevented, and three of these were from iron turning lathe gears, which both employers and workmen say it is impracticable to guard, also unnecessary. Nearly all of the rest might have been prevented by the exercise of ordinary care on the part of the person injured. In these remarks I am not alluding to the accidents caused by the fire and boiler explosion.

The eight preventable accidents I refer to are: Finger in feed gear of picker; finger in gear of dye-vat reel; three different accidents to fingers in lathe gears; finger in cogs of spinning frame; arm lost in a flax mill; woman killed—dress caught by an upright shaft—going where she was forbidden to go. These might have been avoided had the law been conformed to, but the places where they occurred must have escaped my notice. The upright shaft by which the woman was killed, I feel sure I had never seen till after the accident, though I had twice previously visited the mill. It was in a small addition outside the main building, and was reached by dark, narrow and slippery steps which I must have overlooked in my previous visits. Where the arm was lost in a flax mill, the shaft was uncovered at the time, though generally protected by a scutching frame. I have dwelt on these matters a little at length in order to show

that though the number of accidents has increased over that of former years, it has not done so actually, but, on the contrary, decreased, in the direction influenced by inspection.

Nearly all accidents reported to me during this year might have been avoided by the exercise of ordinary care. I do not say all, but nearly all, of those happening outside of where the law requires protection. There are some accidents that cannot always be foreseen, such as explosions of metal, steam and gas, sticks being thrown from wood-working machinery, breaking of saws, emery wheels, pulleys and chains, and some others. Again there are some machines requiring such close and continued attention, such as metal stamping presses, fed by the fingers, that it is not possible to keep the attention always on the work being done, and the least inattention while feeding or removing is liable to be punished by a pinch or the loss of a part of one or more fingers. I have seen guards put on some of these presses, but was informed by the proprietors that they reduced the quantity of work turned out by 20 per cent., and as the operatives, usually boys about 15 years old, were paid by piece work, they preferred to take the risk without guards rather than a reduction in earnings. It is possible and probable that if this work were paid for by the day such accidents would not be so numerous.

In looking over the industries in which the reported accidents happened, I find that wood working is responsible for 50, as follows: From circular saws, 25; planers and shapers, 17; stave knife, 1; splitting knife, 1; sand-papering machine, 2; sticks flying, 3; stuck his finger in lathe centre hole, 1.

Metal industries, principally iron and tin, are responsible for 25 accidents, as follows: Gears, some of which were guarded, 4; drop-hammer, 2; hoisting chains breaking, 1; iron planers, 2; iron shears, 1; set screw and drill mandrel, 1; explosions of metal, 2; tin stamping and cutting presses, 9; soldering machine, 2; in rollers, 1.

In the textile industries 16 accidents were reported, 1 of which was fatal. Fruit and vegetable canning factories reported 4 accidents, and, strange to say, all in the same kind of machine, the corn sheller,—new to most of these factories—for removing grains from the cob. Operatives are apt to get a finger in the knives if not careful.

The other accidents not alluded to above, happened in different industries: falling down elevator well-holes, one of which was protected, and the other was being repaired, 2; printing presses, 2; lead-shaver, 1; grindstone, 1; tampico knife, 1; sewer pipe press, 1; bursting pulley, 1; etc.

One of the above is worthy of note. It is the killing of a man (foreman), in a wood-working factory in Toronto, by the bursting of a wood-pulley—the style now coming into general use. The rim was made of segments of wood well glued together, and about 34 inches in diameter, 6 or 7 inches face, with two arms across, through which is an eye to fit on the shaft. The arms in this case were fastened to the rim by long wire nails. The pulley was used to drive a counter shaft running a circular saw which sometimes was used to cut hardwood planks of 4 inches thickness. This no doubt if fed heavily and crowded would cause great strain on the rim and loosen it from the arms, and this play would increase by use till it became so great as to allow the rim to get out of line with its belt causing it to come off and a general tangle ensue, in which the rim would be torn apart and thrown from the shaft, and so it happened. One piece of the rim struck the foreman on the head, killing him almost instantly. From what I learned on enquiry I concluded the above would be a fair explanation of the cause of this accident, as I was told that previously at times, a thumping in the pulley was heard, and the shaking of the floor above felt, and that the foreman's attention had been drawn to it, but he did not seem to suspect the cause or realize any danger. I believe this build of pulley of large diameter, and having only two arms attached to the rim by wire nails only, is not sufficiently strong for any heavy work where there is a liability of great and sudden strain; and while it has many advantages over cast-iron pulleys where its work is steady and not too heavy, I do not think in this particular case it was the build of pulley for the work required. An improvement is now made by some in the wood pulley, by having the arms built in the rim and project through to its outer surface, which is more reliable than depending on nails to attach the arms to the circumference. It is only fair to say that cast-iron pulleys do also sometimes break under great strain.

I have had reported to me eight accidents, more or less serious, from putting on or taking off belts. I do not see that the Inspector can do much to prevent injuries from this cause. There are many belts that are dangerous to put on or off—some from their size, some from the high speed of the shafting and others are in places awkward to get at. In many factories, I am told that it is the wish of the employers to have the speed slowed down in doing this work, which is done in most cases where there might be danger; but here and there no precautions for safety are taken by the persons performing these duties; and when one is once caught by the belt winding around the shaft no mechanical device for stopping the shafting is sufficiently speedy to do so in time to prevent serious bodily injury, if not loss of life. It was having this in view when in a former report I made allusion to the great need of some sufficient alarm or signal to the engineer or of some device by which a line of shafting could be at once disconnected from the main driving power. But while these devices are convenient and often serviceable they are seldom sufficiently prompt in their action, or in being operated to prevent serious injury. Therefore it is the duty of persons handling belts to use every precaution to avoid accident.

Singular and most unexpected casualties occasionally arise from putting on belts, one of which occurred this year in a machine shop in my district, as follows: It seems the skilled machinist wished to put on a belt on a machine not much in use, and asked a farmer standing by waiting for some work to be done, to hold the belt on the loose pulley of the machine while he went up the ladder to put it on the overhead pulley. He was standing on one foot on the ladder with the other foot projecting out, the farmer allowed the belt to come off the pulley of the machine, it began to wind around the shaft above and in doing so the loop of the belt passsd over the projecting foot of the man on the ladder, passed up between his legs, carried him many times around the fast revolving shaft striking his head and body every revolution against the floor and beams above. He was instantly killed and the floor was sprinkled with his blood right across the wide room. A friction grip pulley was attached to this line of shafting within 40 or 50 feet and was used as soon as possible, but too late to save the unfortunate man's life. This was related to me by the manager of the works and is, he thinks, the probable account, but all was so quickly done that one could not be certain. Some persons reading or hearing the account of this accident might think it could have been avoided had the machinist asked some fellow workman, instead of an man unskilled, to assist him; others that the shafting should have been slowed or stopped for the purpose.

Putting on or off belts is one of the oft recurring duties that fall to many workmen, and it is left to themselves to do it as may be required, without any special orders from the foreman for each occasion; they soon become familiar with it and no doubt omit some of the necessary precautions.

In connection with this I may add that the Waterous Engine Works Company of Brantford, are now making a friction grip pulley in various sizes, by the operation of which the rim can be started and stopped at pleasure by the use of a handle within easy reach. This is now being very largely used for driving machinery and does away with the tight and loose pulley system, saves the wear of belts by permitting them to remain idle, when formerly they were running on the loose pulley, and does away to a great extent with putting on or off belts. I feel pleasure in giving favorable mention to this friction grip pulley in my report believing as I do that as it becomes more generally into use, accidents from belts will become less.

Cleaning machinery in motion accounts for three accidents. Examining or adjusting moving machinery also adds three accidents to my list.

Extent of Injuries.

I regret to state that 12 fatal accidents have been reported in my district this year, against 4 last year and 7 in the year previous. Of these 7 were instantly killed by the explosion of a boiler at Staples; 1 by being carried around shafting by a belt; 1 by falling on a circular saw; 1 by being struck on the head by a bursting pulley; 1, a women, by dress wound around upright shaft; 1 struck in abdomen by a stick thrown from a saw.

Fingers lost or partly so, 61 ; fingers bruised, 51 ; hand or arm injured, 24 ; hands off, 2 ; arms off, 3 ; legs injured, 4 ; eye lost, 1 ; collar bone broken, 1 ; ribs broken, 1 ; bruised jumping from burning building, 7 ; burned or scalded, 6.

Of the persons receiving injuries there were 4 boys—3 of whose ages are given at 14 years and 1 at 13 years ; 16 females, all over 15 years old ; all of the other persons injured are males from 14 years of age upwards.

All of the 128 accidents reported to me happened in 78 different factories, of which fifty-three reported 1 each ; eighteen reported 2 each ; two reported 3 each ; one reported 4 ; one reported 5 ; one reported 7 ; one reported 8 ; one reported 9 ; showing that 25 factories reported 75 accidents, or nearly 60 per cent. of the whole. Viewing the chapter of accidents from this point, it would seem that for the most part either the machinery is very well protected so far as the law requires it, or that the operatives are using ordinary care ; probably both. There are many factories which I visit that have not as yet had occasion to report an accident.

Boilers.

The explosion of a boiler at Staples has brought this subject prominently to my attention, and before closing the subject of accidents I would like to give you some thoughts that have occurred to me on the matter of boiler inspection to prevent explosions. I may say that though I have not, in my inspections, taken any notes that would give me the correct number of boilers in use in the factories in my district, still I believe that I am within the mark when I set it at 600. Of this number I know of only three explosions of boilers in my district this year, viz : that at Staples, killing 7 persons and scalding 3 others ; that at Elmwood flour mills, killing the proprietor ; that at Golden Valley saw-mills, scalding one man. The latter two establishments did not come under the Act, not employing six persons. As to the boiler at Staples, Mr. Geo. C. Robb, Chief Engineer of "The Boiler Inspection and Insurance Co., of Canada," who examined the fragments after the explosion, kindly gave me his written opinion as to the cause of the explosion. It was to the effect that a leak under the steam dome caused corrosion of the plate to which it was attached, eating away nearly one-half its thickness. The boiler was covered with brick and mortar, which while assisting the corrosion, hid its action from view, till eventually the boiler at this place became too weak to resist the ordinary working pressure, at or about which it is supposed to have been when it exploded. The explosion of the boiler at Elmwood is accounted for simply by the fact that the safety valve was tied down with a rope to the handle of the manhole cover. Concerning the explosion at Golden Valley, I have no information as to its cause. One other explosion occurred at Embrun, in the eastern district of the province, killing two men, and one at Dunnville in May. So far as I have able to learn, only 5 boiler explosions (in manufactories) took place in this province this year, resulting in the death of ten persons and scalding of four, which is a small percentage out of an estimate of about 1,000 boilers in the province.

I am not sure that compulsory inspection of boilers would reduce this percentage, but it would be a constant expense and annoyance to the proprietors, without, I think, any good end being accomplished.

Would an inspection of a boiler be thorough ? And that means a great deal, examining the whole shell inside and out occasionally. Unless it were thorough would it have revealed the weakness in the boiler at Staples that was covered with brick and mortar ?

Would inspection and a satisfactory certificate at Elmwood have prevented the tying down of the safety valve which caused the explosion there ?

I believe such inspections as are made by boiler insurance companies to be thorough, and a great preventive to the explosion of such boilers as they insure, as they have financial interest in the safety of such boilers which necessitates careful inspection. But I have doubts if compulsory inspection would reduce the number of explosions in this province, unless accompanied by another law requiring that every man in charge of a boiler shall be possessed of a certificate of competency to perform that work. Boilers might be inspected by men competent to do such work and pronounced sound and safe for the duty

required ; but disaster or injury might soon after overtake the boiler by ignorance or a few moments' negligence on the part of the person in charge.

Some boilers are sound and strong but too small for the work required from them. They are consequently forced, the evaporation is rapid, and suddenly the water gets low and the pressure increases, leading to danger of explosion or injuring the boiler. Many boilers feed by inspirator or pump only ; these sometimes fail just at a critical time when water is required. Again in the stave districts it is often the case that old second hand boilers are bought for the purpose solely of steaming at low pressure the wood in process, and it sometimes happens that these boilers are pressed into service to add to the power for driving machinery, at an increased pressure, which means possible danger These are instances where I think compulsory inspection would be of no service, but where in my opinion it is most required. More knowledge on the part of owners, users and attendants of boilers would, I think, be a step in the right direction. Some people say that every man (and there are boys, too) in charge of a boiler, should have a certificate of competency. I have heard many object to this on account of the higher wages that would of necessity be paid to such skilled men, and that it would be a hardship to employers in a small way, employing say 6 persons, to be compelled to pay the same wages for boiler attendance as one employing 600. I need not mention that all the larger factories using steam have competent men to look after their boilers.

In thinking over boiler explosions and suggested legislation, more or less, these last five years, an idea presented itself to me which I lay before you. It is this: That in the absence of any legislation in the matter of boiler inspection or of requiring a certificate of competency from the man in charge of a boiler, it might be well for the Government to appoint a mixed commission of five or more persons, machinists, boiler makers, practical engineers and scientific men to consider the question ; draft a set of instructions for the care of boilers of different kinds, circumstances and conditions ; information as to the different impurities in different waters and on all matters necessary to the taking of proper care of boliers ; and have the results of their deliberations printed and distributed freely among proprietors and boiler attendants—very similarly as is now done by the Provincial Board of Health, when there is fear of an epidemic. This, I believe, will spread among the people concerned the necessary information and not be a burthen on any class. I do not set forth this idea as an equivalent to inspection, and competent men in charge, but merely as a substitute till something better is probable.

I have the honor to be, sir,
Your obedient servant,
ROBERT BARBER,
Inspector of Factories, Western District

Toronto, December 31st, 1892.

CENTRAL DISTRICT.

To the Honorable the Minister of Agriculture :

Sir,—I have the honor to submit the following Report on Factories' Inspection for the year 1892 :

Age of Children.

The Compulsory School Attendance Act requiring the attendance at school of children until fourteen years of age, would be greatly aided by an amendment to the Factories' Act, making fourteen the age at which children could be legally employed in factories. A certificate from the school authorities as to proficiency, age, etc., being required before employment could be obtained would also aid the School Attendance Act.

As the Factories' Act was designed principally for the protection of children and young persons employed in factories, the number of persons constituting a factory being where more than five are employed, should not, if less are employed, tend to restrict protection to those who are infants in law. Complaint was made in regard to the hours during which a boy was employed, he being kept at work from early morning till eight or nine o'clock at night, and then being required to do "chores" for the house. The shop in which he was employed, not having the number employed requisite to constitute a factory, did not come under the operation of the Act.

Closets.

In the matter of closets, some factories where few females have been employed at first, and where conveniences have been sufficient for the small number employed, when increasing the number of their female employees have neglected to increase the number of conveniences proportionate to the number of females employed, until the matter was brought to the notice of the employers. A complaint has been made that in one of the factories female employees are charged five cents per month for cleaning the closets used by them ; while the amount is small in itself, they cannot understand why one sex is required to pay while the other is exempt.

Hours of Labor.

Complaints have been made that females have been worked for a longer period than allowed by the Act. During the holiday season I found several places where females were working up to eight or nine o'clock p.m., but the number of hours constituting a week's work, viz., sixty hours, not having been exceeded, I notified the employers that they had better obtain an overtime permit, if, owing to a pressure of business, such was necessary. In some clothing factories complaint was made that females were worked more than the limit allowed. On enquiring of some of the employees, I was assured that such was not the case, although I was afterwards informed that the employees were afraid to tell for fear of being discharged.

During the hot weather all who can afford to do so generally try to get recreation and rest. But it is at that time that some mills require to work overtime, in order to get samples for next season's trade. The employees of these mills, instead of getting rest at that time, are required to work overtime. The management of the cotton mill at Kingston, having noticed that many of the employees stopped off work for a day or two now and again in hot weather, announced that the mill would shut down twice, for three days each time, on certain dates, to afford a rest, if the employees so desired. The result was that the employees remained at work till the mill shut down, and the experiment having proved satisfactory, I believe it it intended to continue the same in future. It is a matter for regret that operatives in factories should not be able to afford the expense necessary to take a vacation for a week or two during the hot weather each year.

A factory inspector in Pennsylvania tells of an employer who provides a trip to his employees every summer which may be worth quoting: "The following is a true picture existing in this State, and I have twice personally inspected it. Everything is in perfect order, the very acme of cleanliness is manifested from cellar to garret, the exits are models of perfection, everybody in the establishment is trained to move with the ease and precision of a well drilled military company. Were a fire to break out, instead of wild commotion, every one of the girls (more than 100 in number) would await the forelady's orders and follow her. The manufacturer furnishes each girl two dresses and caps a year; they go to their work well dressed, and each has a very nice, clean and inviting dressing-room, there are elegant wash-rooms, a number of private bath-rooms, a most charming dining-room, reading-room and library. Dinner is served every day at noon, a very good kind of china-ware is used; the dinner is always good, the foreman and forelady dining with the girls. The meal is furnished free. Eight hours per day is the maximum day's work, and every summer an extended trip is taken for two or three weeks without cost to the employees, the manufacturer taking them to his private pleasure resort, more than a hundred miles from the factory.

"I asked the manufacturer how he managed to pay such good wages, maintain such desirable conditions, and yet compete with his rivals? He replied, 'I never know any rivals.' I said, 'Will you allow me to publish an account of my observations?' and he said, 'No, sir, no reporters are needed here. I do not do these things for notoriety or advertisement. It is simple justice, as I understand my duty to my employees.' Were it not for his request to the contrary, I would here give his name and address; but if any one reading this brief account of factory inspection doubts its accuracy (and I would not blame anyone for doing so), I will gladly accompany him to the place and enable him to see for himself." Verily, if all employers were like the one referred to, there would not be much trouble in solving the labor problem.

Fines.

Complaints have been made in regard to fines imposed on operatives for being late, for imperfect work, for forgetfulness, for talking, etc. As the fines in the aggregate may amount to a considerable sum during the course of a year, it would be interesting to have a return showing the offences for which the penalties were inflicted, how the money was disposed of, the names of those commissioned to inflict the penalties, and the authority under which they act. Parties learning are stated as not being exempt from fines for imperfect work. A case was reported to me of a girl who worked for two weeks in a factory, and who at the end of the time owed the firm fifty cents, the amount to have been paid as wages having been absorbed by fines, and not having been sufficient to satisfy the fines incurred.

Accidents.

The number of accidents reported as having occurred during the year are ninety-seven, six of which resulted fatally. Of the whole number twenty-nine have been caused by circular-saws, two of which were fatal. In one case, a boy of fourteen, who was employed as a roller-boy in piling lumber, entered the mill. "The tail setter having just stepped off the saw carriage to clean up some saw-dust and bark the boy jumped on, and after the log had passed the circular, he pulled the lever that draws the dog out of the log. The log went all right on the skids for the gang-saw: and the carriage started back as usual, but the boy lost his balance as he was pulling the spring lever back, and the lever and himself swung over in front of the five-foot circular saw, which cut him on the back and side, killing him instantly." The boy is alleged to have been very forward; and it is stated, had been warned against going into the mill at all.

In the other case the lad, Arthur Ashton, went on the slash-table, while the machinery was in motion, in which are five circular-saws, for cutting slabs into length for laths, to clear two of the saws which were stopped. In removing a piece of wood which had caused the stoppage, he stumbled on the third saw on the table nearly severing his right foot.

The sole of his boot binding on the saw is supposed to have caused him to twist around, so that his left thigh came in contact with the same saw, the thigh bone being cut through. Death resulted twenty-four hours after the accident. Deceased was an orphan from the Chelsea and Kensington School, England, and was characterized as being a good and willing lad to work.

In the case of the explosion of benzine there was no fire in the apartment, and the nearest fire was over sixty feet from the rinsing tank in which the explosion occurred.

As regards the lad whose foot was caught in a belt, it is alleged that the deceased volunteered to put a belt on an overhead pully to drive a grind-stone the man whose duty it was to do so having been temporarily absent. The deceased went up a flight of stairs to obtain access to a platform from which, by stooping down, belts could be put on the pulleys on the shaft by hand. Instead of stooping to do it by hand, he with his foot kicked the belt towards the pulley, and a loop having formed, in which his foot was caught, he was carried around the shaft and his foot torn off at the ankle.

In the case of the fatal accident, caused by the fly-wheel bursting, the deceased is alleged to have been away from his engine, and while running back to stop the engine, which had acquired a dangerous velocity, the fly-wheel burst, a piece of which struck him, killing him instantly.

The man who fell into a tank of boiling dye was engaged in turning a frame in the tank, on which was a quantity of cloth. A piece of plank, at the opposite side of the tank from which he was working, was laid close to the frame to keep the cloth from coming off; in reaching across the tank to draw the plank closer to the frame, his foot slipped and he fell into the tank.

There have been nine accidents reported as having been caused by power or drop presses, and one by drop hammer, making ten in all. Eight accidents have been caused by gears.

In many cases carelessness is assigned as the cause of accidents, which doubtless is true where young people are employed attending to machines, who do not realize their danger, or where "familiarity breeds contempt." But there is also danger in keeping the operative's attention on the stretch for an undue length of time, in tending dangerous machines.

The increased productive power resulting from improved labor-saving machinery, should tend to lessen the hours of labor, and thereby tend to lessen the number of accidents.

The excuse for working long hours is that machinery must be so operated as it would not pay to run it for a short hours' day. But long hours tend to increase production thereby causing a so-called "glut," resulting ultimately in enforced idleness for the workers and decreased prices for employer and employee, unless where a combine may be formed to keep up prices, which does not usually tend to the advantage of the workers. Under the hap-hazard system of production, gluts may alternate with scarcity, thereby indicating the necessity of regulating production, by sytematizing the labor of a nation.

Were mechanics to state that they must work long hours owing to their having adopted improved tools, because it would not pay to keep them idle or work shorter hours, it would be difficult to see where the advantage would accrue to them by the adoption of improved tools; and were the mechanics as a co-operative society to adopt machinery which would increase their productive power to a still greater degree, and intimate that owing to their having done so they would require to work long hours still, people would be apt to think that machinery was not a benefit to the workers, and that it was of greater value than were those who operated it.

Having learned from outside sources that accidents had occurred, which had not been reported, I notified the firms where such had occurred, to do so. Twenty-five accidents would not have been reported had I not learned of them as above stated. In most of the cases the time limited by the Act for instituting proceedings for violation of the Act had expired, so that the time limit would require to be extended.

There are ten of the accidents reported which are not reportable under the Act; but it is deemed best to include them in the report, rather than risk incurring mistakes or causing neglect in reporting accidents in the future.

Fatal accidents, or accidents likely to prove so, should be reported at once.

The loss of life by boiler explosions which have occurred during the year emphasizes the necessity of some action being taken to at least endeavor to reduce the number of accidents from that cause. It has been suggested that owners of all steam boilers used for generating power, should be required to have said boilers inspected and tested by a competent person once in each year, where such boilers have not already been inspected, under an existing insurance policy, said owners to be held accountable that the person so employed shall be competent to so inspect and test boilers. By allowing owners to have their boilers so inspected, they could select such times as would be most convenient for them to do so. Where the owners, or those in charge of boilers, have not a certificate of the boilers having been inspected within a year (and where the Inspector of Factories has asked for the production of such certificate), the inspector should be empowered to have said boilers inspected, and the owner thereof should be liable for expense of inspection in addition to any penalty for a contravention of the Act.

On visiting a saw-mill which had been rebuilt after a fire, I asked the proprietor why, when building, he did not allow for more space between the machines, as the crowding the machines too close together increased the risk of accidents to the employees. He replied that "the bank thought he was putting up too large a building as it was."

There is an obvious necessity for a system of insurance which will, in a measure at least, afford some aid to the families of workmen left destitute by the death of the head of the family, from accident or otherwise. The sending children to work in factories at an early age because either of their parents had died does not commend itself as being in accordance with the principles of Christianity.

Twelve permits have been granted to work overtime during the year. A few employers appear to consider that women or young girls should be left free to work as long as they choose to do so, but the great majority of employers recognize the necessity of a limit to the hours during which females should be permitted to work, and would rather forego any advantage which might be gained by working their female employees long hours, than risk injuring their health.

There have been no prosecutions for offences against the Factories' Act, although cases have occurred where accidents have not been reported as required; but in many cases the time limit during which proceedings could be instituted had elapsed. As many places can be visited only once a year, the time limit, being only two months, requires to be extended. Complaints have been made that in some factories overtime is worked by females more than is allowed by the Act. Unless the names of the places are given and information sent to the inspectors when such occurs, it cannot be expected that they can put a stop to it, or prosecute for a contravention.

Appended herewith are illustrations and descriptions of some safety appliances, as published by the Anti-accident Association of Mulhous, Alsace.

I have the honor to be,

Very respectfully,

JAMES R. BROWN,

Inspector of Central District.

Toronto, December 31, 1892.

SOME SAFETY APPLIANCES.

Following are illustrations and descriptions of some safety appliances, as published by the Anti-accident Association of Mulhous, Alsace:

Casing for Saw Under the Bench.

To prevent accidents arising from contact with the saw under the bench, as for instance during the removal of sawdust, the blade is incased in boards or protected by doors of wood or sheet iron, which reach down deeper than the largest timber to be dealt with.

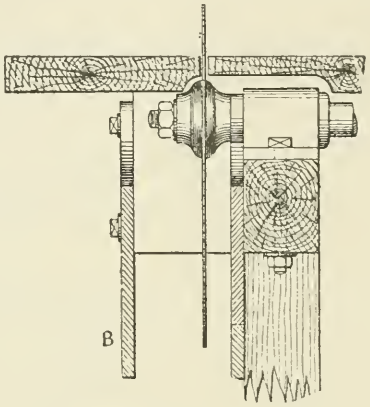

Fig. 1.

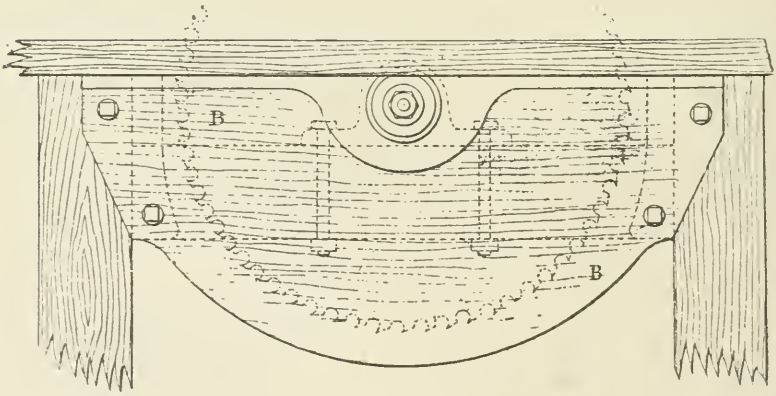

Fig. 2.

☞ At Figs. 1 and 2 a safety board B is represented, which is intended for a saw that can only be reached from one side. If the saw should be approachable from both, then two of such boards are used.

Safety Board Against Splinters.

This board, Figs. 3 and 4, is fastened according to circumstances, either to a hanging beam B or to a lateral support by means of a bolt S and a fly-nut, and can be displaced

vertically by the aid of the slot C. This appliance is only to be recommended in cases where the safety hood cannot be applied, either because the dimensions of the timber or of the saw blades vary considerably, or even because the timber, owing to its size, cannot be lifted up.

Sometimes also the riving knife cannot be applied owing to the faulty construction of the saw; in that case two iron levels R, bent to an angle and fastened behind the safety-board A right and left of the saw blade should be adopted.

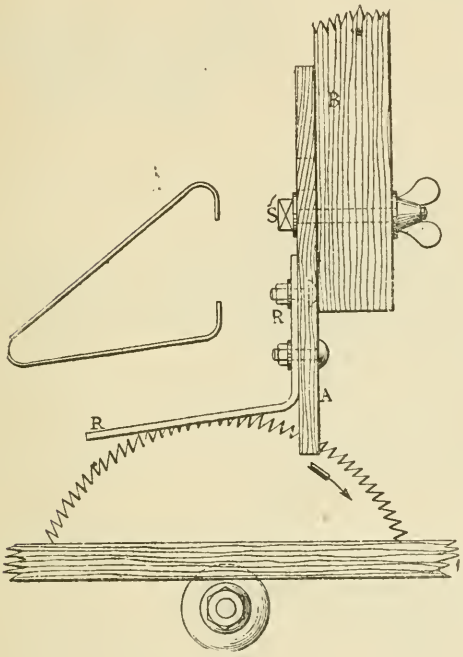

Fig. 3

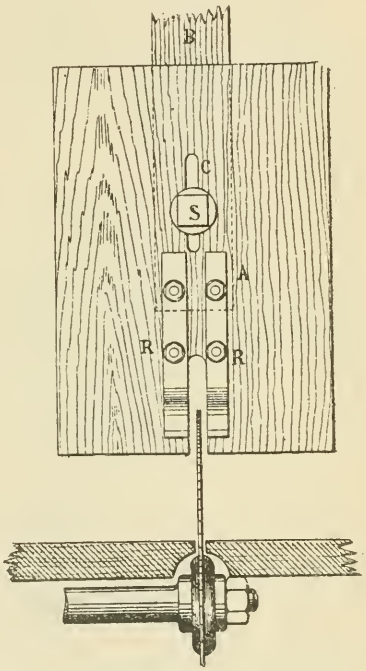

Fig. 4.

Safety Hoods.

A safety hood should fulfil the following conditions:

1st. The workman must not be prevented from seeing the working points of the teeth or following the course of the saw cut.

2nd. It should be attached in such a manner that the bench remains exposed as far as possible, so that work may not be interfered with.

3rd. It should satisfactorily resist any longitudinal or transverse thrust or pressure.

4th. It should permit the workman to keep almost continually at work, and should not have to be lifted up or taken completely away.

Fixed Safety Hoods.

For the sawing of thin boards, with saw blades varying but little, it will suffice to fix a vaulted tin piece T (Figs. 5 and 6) about an inch and a half wide over the saw and carried by the flat iron B which is bent to an angle and screwed down to the bench at a considerable distance from the blade.

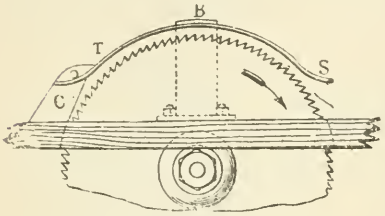

Fig. 5.

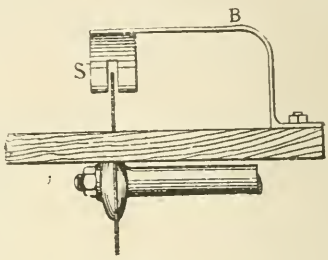

Fig. 6.

When the thickness of the timber varies but little a movable beak D with the slot E (Figs. 7 and 8) is attached to the front of the hood. This hood is connected with the riving knife, and with the rod A that is fastened to the wall by means of an eye *a*.

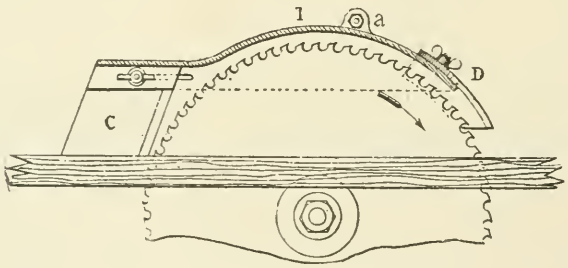

Fig. 7.

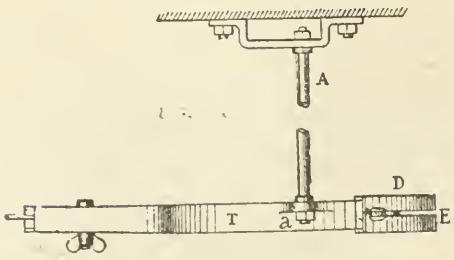

Fig. 8.

In the case of small saws it is sufficient to cover the blade (Figs. 9 and 10) with a small board B, which is connected with the rigid piece A by means of hinge-joints CC, and is secured by the bolts PP and fly-nuts.

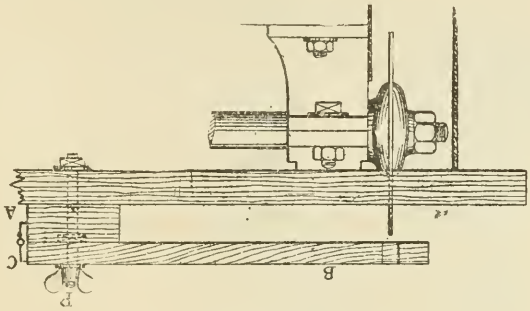

Fig. 9.

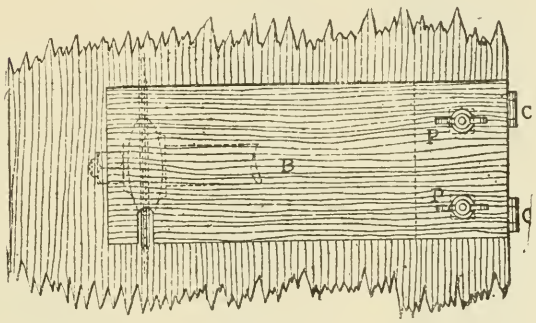

Fig. 10.

Safety Hoods Movable by Hand.

One of the best systems consists of a hood B of wood (Figs. 11 and 12), or better still of sheet iron and wire netting (Fig. 13), which is connected with the hanging-beam D or a support fastened to the bench by means of a lath or a flat iron T with a slot. The curve *b* of the hood terminates an inch or two above the lower edge of the surface B, the latter being perforated so as to light up the teeth. The hood is balanced by the counterpoise Q, and can be held up at any desired height by means of the bolts P with fly-nut.

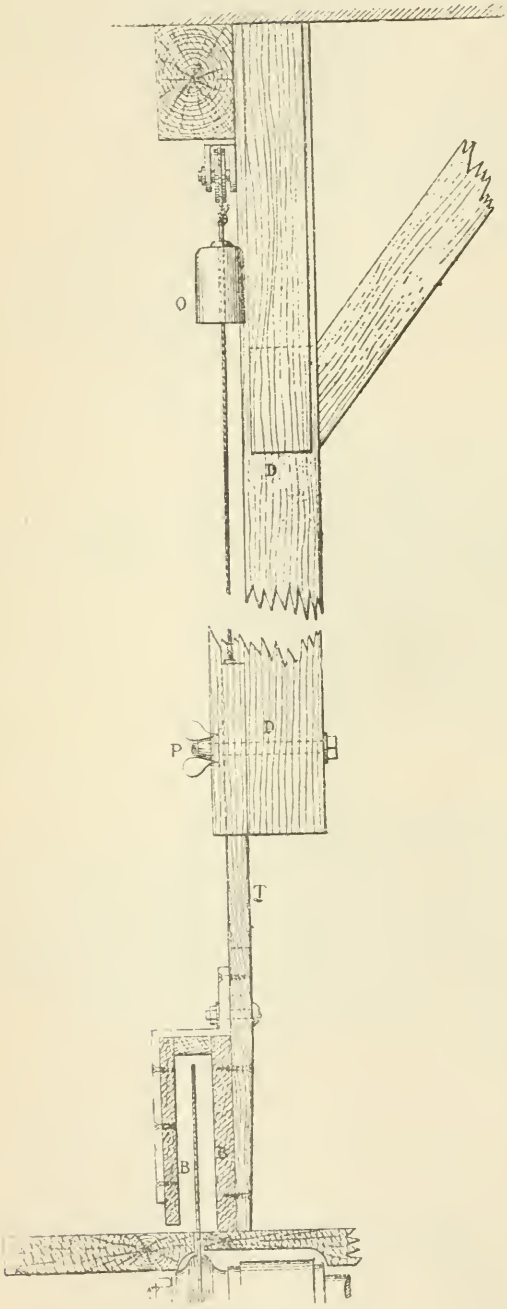

Fig. 11.

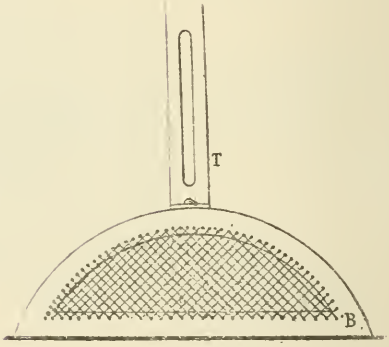

Fig. 13.

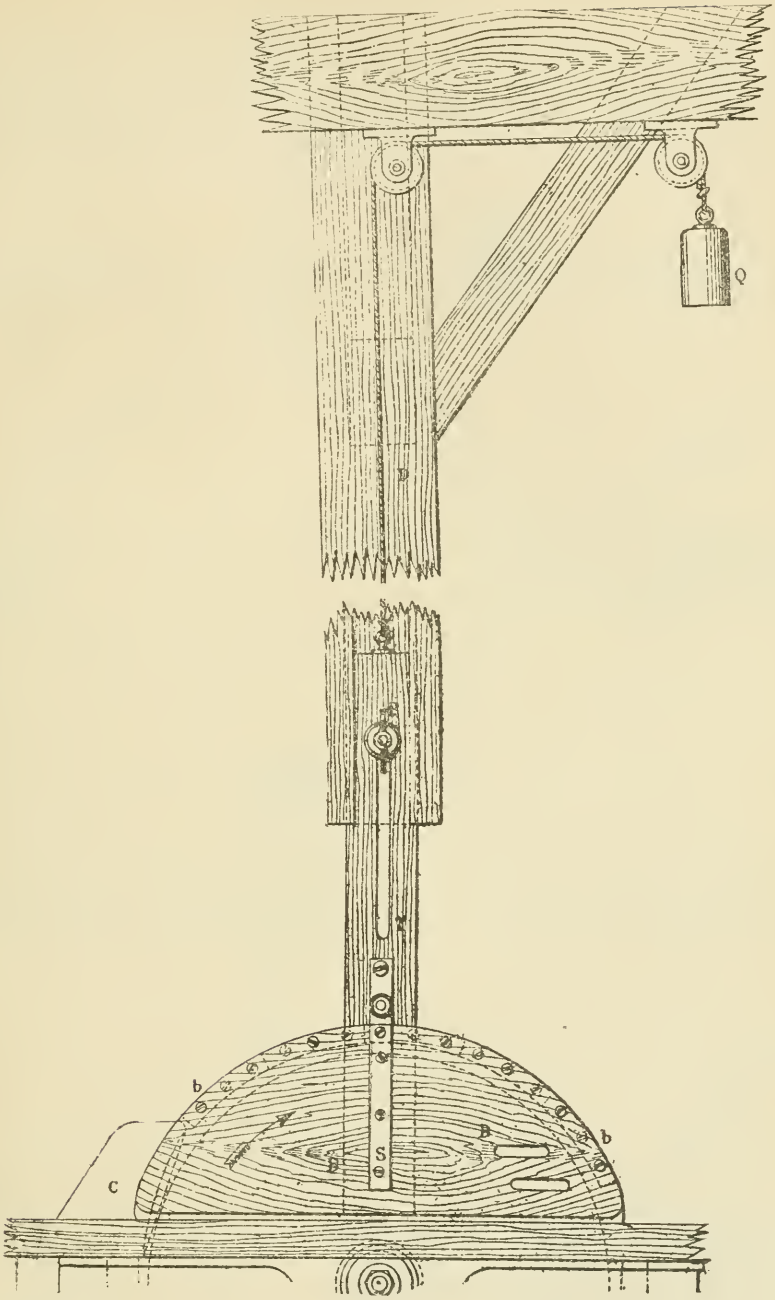

Fig. 12.

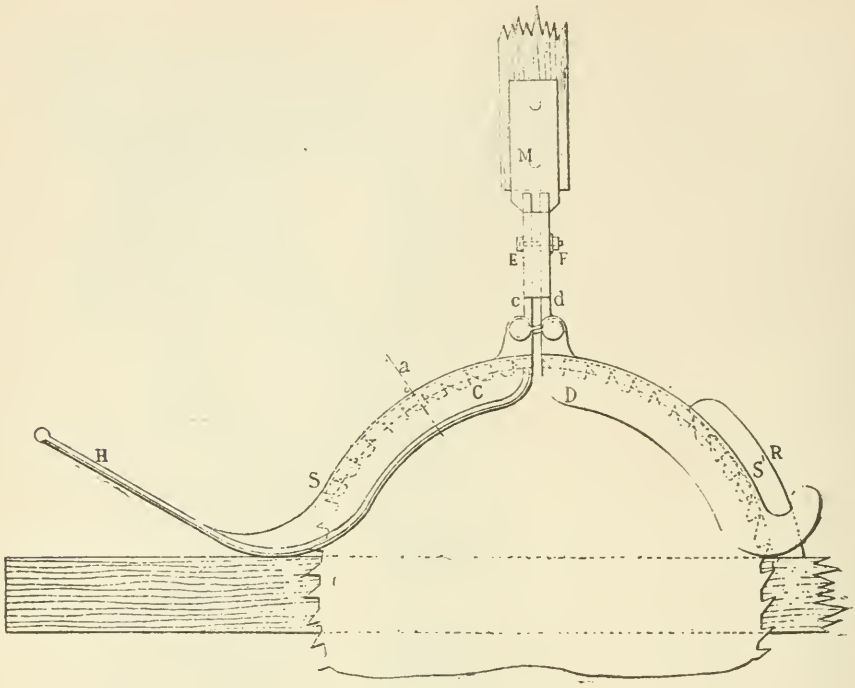

Fig. 14.

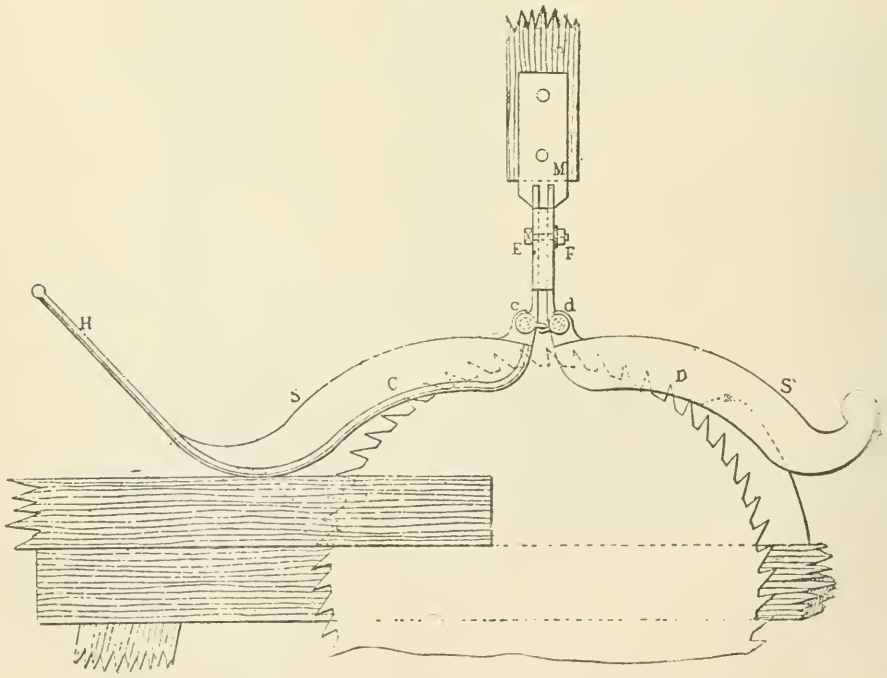

Fig. 15.

Hoods with Automatic Lifting Motion.

The Nardin appliance (Figs. 14 to 17) consists of two hoods, C and D, which are hung upon the pivots *c* and *d* of the shoulders E and F that are movable vertically. The hood C which carries the beak H lifted by the timber takes the hood D with it through the agency of a finger fastened to the pivot *c*; the pivot *d* has a similar projection, yet *c*

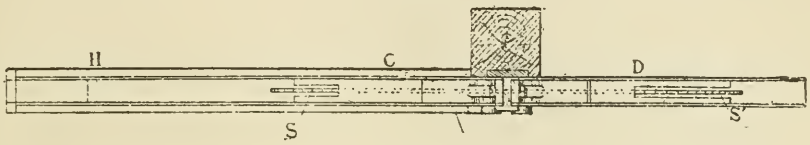

Fig. 16.

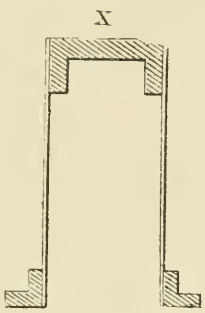

Fig. 17.

can drop down without taking D with it. The cast iron segments X of the hoods are provided with perforations S which admit of the saw-cut being watched, and with a slit through which the riving knife R enters.

EASTERN DISTRICT.

To the Honorable The Minister of Agriculture:

SIR,—I beg to submit my report on inspection of factories and mills for the year 1892.

I have not noticed during my inspection for this year the same progress in improving and protecting the machinery to prevent accidents that I had remarked the previous year. There has been, nevertheless, in some instances, some alterations made in accordance with the orders I had given whilst in some cases, very little attention seems to have been paid to my suggestions. I have also remarked more accidents during this year than any previous year since the Act has been in operation, although I cannot say that they are due more to defects of or want of protection to machinery than in any previous year. A very serious explosion of boiler occurred in a small saw mill, causing several deaths, full particulars of which will be found hereafter. This accident was so serious in its results that I deemed it my duty to make a thorough investigation, although the mill did not come under the Act, in order to ascertain the real cause and to be in a position to propose some means of preventing its recurrence. As it will be seen by the special report of this case, the accident was due to the want of experience and the inefficiency of the men in charge of the boiler.

I have again this year inspected some small mills and factories not covered by the Act, but where I thought the machinery and power used were of a dangerous character, and where more protection was required to prevent accidents.

In one instance I have prevented some parties from using in a small saw-mill in course of erection a boiler taken from a mill which had been burned down twice.

I have also noticed a great source of accidents this year in large mills and factories, which I had not noticed previously. It often happens that in these places the whole machinery is stopped for a short time either for some repairs or for the purpose of oiling. During this time the employees are at leisure, some taking advantage of this delay to clean up the machinery in their charge, others standing carelessly around them, when suddenly, without sufficient warning, all the machinery is started. Sometimes a whistle from the boiler is blown, but it is not always heard in every part of the building. To obviate this difficulty and to remove all dangers in such case, it would be necessary to introduce a system of electric alarm bells, having some placed in different parts of the building, so that the engineer could, before starting or connecting the power to the machinery, give proper warnings to all the employees.

There is another source of danger which has come to my notice, but over which the inspector has no control: it is the very loose dress which the employees wear while working around gearing wheels, belting, or shafts. Very often accidents are reported of persons being drawn by a belt around a shaft, or in gearings and crushed. I have no doubt that in several instances had a thorough investigation been made, it would have been reported that the accidents were due to the loose clothes of the victim.

I have known some accidents occurring, with fatal results, due to this reason. One has been reported to me lately by a friend who had a brother killed in this manner. The power was connected to the machinery without warning when he was standing near gear wheels, and the loose jacket he was wearing was caught and he was drawn in and mutilated to death.

My object in mentioning this fact in my report is chiefly to draw the attention of those labor societies, organized for the protection of their members and their fellow-workmen, who could, by discussing this question, and by proper advice, obtain more satisfactory results than the inspector, who has no authority in this respect, and from whom only such suggestions as can be enforced by law would be accepted.

Since my previous report, one factory for the preparation of mica has been started. In this factory several accidents occurred through the want of sufficient experience of the employees to whom the work was new, and also to the absence of proper guards to the machinery. The process of preparing the mica consists in cutting it with punches moved by electric power and connected by the operative with his foot. I have observed that in connecting the power, the operative had a tendency to accompany the movement of the foot with the hand, which he would shove under the punch and have his fingers cut off. This is now prevented by the guards which have been placed, and all danger is thus removed provided these guards are replaced and kept on when displaced to change the dies.

The dye tubs, in some places, I have found rather low and dangerous. In dye rooms the floor is always damp, and persons working at the tubs are exposed to slip and fall in the boiling water. These tubs should be at least three feet six to four feet above the floor; this height I have ordered in case of new tubs, or replacing old ones. And in case of old tubs not having a sufficient height, I consider that an iron rail should be placed to guard any person from falling in.

On the twenty-sixth day of February, 1892, I received an anonymous letter from Carleton Place, stating that the Hawthorne woollen mills of that place were working small boys some 13½ hours per day till 9 o'clock at night, not allowing them any time for an evening meal, and that six of these boys had been discharged from the factory for refusing to comply with these regulations. On receiving this letter I immediately went to Carleton Place, where I arrived at seven o'clock in the evening, and at once proceeded to the factory, which I entered without any notice being given, and without the knowledge of any person except the night watchman. I found in the upper storey some eight or nine young boys working in the spinning room. On questioning them I have learned that, with the exception of one who was thirteen years and nine months, all were over fourteen years of age, and that they were allowed three-quarters of an hour for their evening meal. The following morning I instructed the manager to dismiss from night-work the boy under fourteen years of age, and I learned from him that four boys, from eighteen to twenty years of age, had been dismissed for trying to get up a general strike in the factory for wages.

Another complaint, from the Cornwall Weavers' Union, was transmitted to me by order of the Hon. the Minister of Agriculture, which was duly acknowledged. I may repeat here that, in order to be in a position to take into consideration all complaints and to give them proper attention, they should be specific and not general, and made in a proper spirit. With regard to the Weavers' Union of Cornwall, I may state that although I had been in Cornwall inspecting the factory only a few days previous, no complaints of any kind were made to me personally, and I could get no information from any employees about any infraction of the Factories' Act.

Child Labor.

With regard to this very important question, I can add very little to what has already been said in my previous report. I have observed the same evils, and I can only hope that the Government will, before long, deem it advisable to pass such legislation that will protect those who are destined to form the future generation of this country, by preventing them from being employed at such works and confined in factories during such long hours as would tend to impair their constitution and check the development of their intelligence. I have met, in one factory in Cornwall, two children who, though they were of age required by the Act, were so delicate and who appeared to be of so feeble a constitution that I would not allow them to remain at work unless they would secure a proper certificate from a physician that they could be employed without danger to their health.

I must again repeat what I have stated in my previous report, that I regret the abuse of employing so many young boys in saw-mills, and to subject them to work beyond their strength, for no other purpose than to economize in the payment of wages; and very often these children are employed during night where mills are running constantly. I consider that in these saw mills none should be employed under fourteen or fifteen years of age during day-time and under eighteen during night.

I have experienced a great deal of difficulty in ascertaining the age of young children, as very often the parents, who are very anxious to secure employment for their children, give them certificates in which their age is falsely stated. But I expect to be in a position in future to detect all such cases through private information, when, without any further notice, as proper notice has been given several times, I will have recourse to prosecution under the Act.

Fire Escapes.

Mostly all factories I have inspected this year are provided with proper and sufficient means of escapes in case of fire. There are still some which are not as well protected in this respect as I would desire to see them. They have promised to attend to this matter at once, and I hope that before long they will all have fully complied with the requirements of the Act in this respect. All factories and mills are well supplied with modern fire extinguishers, and it seems almost impossible that a fire occurring during werking hours would cover much ground before being checked.

Accidents.

Very few accidents have been reported to me during the year. I regret to have to say that several employers are very neglectful in this respect, as I have heard of four or five accidents which have happened during the year and of which I have received no report. In some instances, if I had known of the accidents before the time limited by the Act, I would have prosecuted the employers for neglect to report them. These frequent failures to report these accidents have compelled me to take such steps for next year as will ensure a prompt report and will enable me to prosecute any violation of the Act. There can be no excuse of ignorance given, as every employer has been frequently notified and have all received a copy of the Factories' Act.

The accidents reported to me are as follows:

Hawkesbury Mills: One man (Lanzon) had his leg broken in yard.

Cornwall Woollen Mills: One girl had her hand crushed in gearing of card machine; she was three months out of employment.

Toronto Paper Mill, Cornwall: One man (Curran) had his hand cut by a saw used to cut wood for paper. One Chapman, scalded by the explosion of a valve on boiler.

Hawthorne Woollen Mill, Carleton Place: A boy, fifteen years of age had his hand bruised by carding machine.

Rosamond Woollen Mill, Almonte: On 16th June, a girl had her hand caught in gear of carding machine, flesh wound to hand and wrist. On 26th of July, one female employee had her finger bruised, necessitating amputation. One November 5th, one boy had tops of two fingers cut off in cloth shearing machine.

Three accidents at Gillies' saw-mill, Braeside, were reported to me at time of my inspection. One man had his leg broken by lumber falling upon him in September. One man fell through opening in building; had his collar bone broken. And another man was accidently struck on the head by his companion whilst at work together; laid up several days.

In Watters' mica factory, three girls had their fingers cut off by punching machines. These accidents were reported to me at time of inspection, but particulars which had been promised me were not sent.

Permits.

Only three permits to run over time have been asked for this year, two to complete orders in time and one to make up for lost time.

1. The Canadian Colored Cotton Mills, Stormont branch, 22nd of April, 1892, to make up for lost time caused by water being out of canal.

2. Hawthorne Woollen Mill, Carleton Place, on the 22nd November, 1892, to complete orders.

3. Rosamond Woollen Mill, Almonte, on the 24th of November, 1893, to complete orders.

These three permits have been granted, and the notices required by the Act to be posted up have been sent in each case.

All water-closets, and factories were generally clean and in good condition, except perhaps in a couple of small factories where closet accommodation was not quite sufficient.

The ventilation in every case is very good. In the rag-picking room of the Toronto paper mill of Cornwall, a suction pipe and funnel has been placed in the center of the room to draw away the dust; it is doing very good service and very little dust is now seen.

Boilers.

There have been so many accidents occurring of late by the explosion of boilers, and they are of such a serious character, that it becomes necessary to give this question special consideration. I find three factories having their boilers in the main building where employees were kept at work. One in the Canadian Colored Cotton Mill, Stormont branch, where some forty or forty-five men are working over several boilers placed in the basement. In the Almonte Knitting Mill of Almonte, where six hands are employed in a building with boiler in basement; and in J. A Code's Knitting Factory, where five hands are working immediately over one boiler. In each of these cases an explosion of the boilers would prove fatal to those employees at work in the buildings. I have been particular in ascertaining the experience of those in charge of the boilers, and engines at the time of my inspection, and I have found that in most cases their experiences vary from ten to twenty years. In the three factories where boilers are placed in the basement and having employees working immediately over them, the persons in charge I have found reliable and competent, but they may happen at any moment to be absent through sickness or for other reasons and temporarily replaced by inferior men; and it is mostly under such circumstances that the accidents occur. It would be a very good measure to have all boilers placed in out and separate buildings with a heavy stone or brick wall between the boiler house and main building. This wall would have the effect of preventing an explosion demolishing the main building and also of scalding those who may be employed in the immediate vicinity.

An accident occurred at Lalonde's mill in the village of Embrun, in the county of Russell. As soon as I had read the report of this accident, and hearing so many rumors attributing the cause to neglect on the part of the employer and serious defect in the boiler, I deemed it necessary to go and make a careful investigation on the ground, after which I have come to the conclusion that the person in charge of the boiler was alone responsible for the explosion, and that he had no other experience than having occupied the position of fireman in Mr. Edward's saw-mill at Rockland for two years. The boiler was filled with water, leaving insufficient space for expansion and steam, and in order to get steam up to start the machinery, the person in charge had started a big fire in the boiler causing the explosion. The fireman, Lazure, was killed by a blow from the front of the boiler; two other persons, J. Laroche, and Ant. Grignon, who had come into the mill on business, were killed by being crushed under the building. Antoine Primeau was struck on the leg by a piece of timber, part of the frame of building. Francis Lalonde was crushed under pieces of timber, and will likely recover, but may remain crippled.

I may state here that I am of the opinion that if the boiler had been located outside of the mill and separated by a heavy stone wall, the building would have been saved, and there would probably be but one victim, Lazure, the fireman. I have received all my information from one of the victims, Antoine Primeau, the sawyer in the mill, and from M. Lalonde, jr., who was acting as manager during the sickness of his father.

I called at Primeau's house where I found him in bed, laid up from injuries he had received, and had with him the following conversation, which gives the cause of the accident and all its detailed circumstances: "I am one of the victims at Lalonde's mill. I was struck on the inside of the leg by a piece of wood which penetrated some three inches, and was bruised by frame timber which had fallen on me; the doctor says I will

be all right in a few weeks. I was running the circular saw about twenty feet from the boiler; I could see the boiler and all around it; I cannot tell the cause of the explosion and I do not believe any one could tell, as the engineer was killed; I understand the engineer had very little experience. The boiler had been repaired some two years past, and I knew of nothing wrong about it except the steam gauge which sometimes would not work well; the mill had been running that forenoon; at noon all hands went to dinner and I remained to file the saw so as to be ready to resume work at one o'clock. About half-past twelve, I noticed that the water was very low in the boiler; I filled it up; about one o'clock the engineer came back from dinner with young M. Lalonde who ordered him to fire up to get steam up shortly; the engineer stirred fire in the boiler several times and about twenty minutes past one he used the injector to get more water in the boiler; about half-past one I heard a great noise and before I could look to see what it was I was struck by a piece of wood and crushed under a portion of the frame of the mill which had all tumbled down; I was not scalded, and I do not know of any one being scalded by steam; I know the former engineer; he was not dismissed from the mill, he went on his own accord to help his father in his harvest; I have never heard that he had left the position through fear of the boiler, and I do not believe it, as he came but a few days previous to the accident to M. Lalonde, asking to be taken back to his position; I was not aware of any leakage in the boiler which would necessitate the pumping in of water so soon after I had filled it; the former engineer never told me that he was afraid of the boiler nor that it was dangerous; we are very friendly and I am certain he would have notified me if he had considered it dangerous."

Mrs. Primeau, the wife, showed me the clothes of her husband which were all covered with mud and said that when her husband was brought home they were wet as if soaked in water.

M. Lalonde, jr., gave me corroborative evidence on the main points, although he was not aware at the time that I had seen one of his employees, and that I had received any information previously from him. From these informations it is evident that the engineer had very little experience and was responsible for the accident; that the boiler was in fair condition at the time, and that the explosion was due to the fact that the boiler had been filled with water, not leaving sufficient space for expansion caused by excessive fires made by the engineer. It is also evident that there would have been but one victim if the boiler had been placed outside of the main building and separated from it by a stone wall.

All of which is respectfully submitted,

O. A. ROCQUE,
Inspector of Factories, Eastern District.

Orleans, Dec. 31, 1892.

APPENDIX.

ACCIDENT REPORTS FOR 1892.

ACCIDENT REPORT FOR 1892.—WESTERN DISTRICT.

No.	Date.	Employers.	Place.	Business.	Person injured.	Age.	Particulars.
1	January 11	Brodie & Co.....	Hespeler	Woolens	Frederick Routh	28	Third and fourth fingers of right hand severed at the second joint; was putting band on scroll of mule head-stock, when it accidently started in motion.
2	September 21 ..	"	"	"	John C. Ellis.....	21	First finger of left hand off at second joint, in gears of mule head-stock, while looking for a break, while machine was in operation; idle 7 weeks.
3	January 21.....	Jas. Hay & Co	Woodstock	Furniture	Geo. Downing.....	40	Arm severely cut by stave knife; cutting veneers, put his foot on treadle while his arm was under the knife. A foot power machine—not reportable.
4	September 7....	"	"	"	*John Currie, a foreman	40	Struck in abdomen by piece of board he was ripping on a cross-cut saw; died in 15 hours.
5	January 26.....	J. B. Henderson	Thorold	Knitting	R. S. Dawson	23	First finger of right hand, crushed in gears of picker; amputated at first joint.
6	December 29....	"	"	"	J. Livingston (male)	.. ..	Arm drawn in between worker and cylinder of finisher card; seriously injured.
7	February 3	Gall, Anderson & Co.	Toronto	Planing, etc....	O. Orchard.....	30	Left hand cut by cross-cut circular saw.
8	" 3	Peerless Mfg. Co.....	Hamilton	Churns, etc.....	F. G. Austin	32	Third and fourth fingers of right hand badly cut by shaper; no amputation.
9	" 8. ..	Norton Mfg. Co	"	Tin cans.....	David Scott.....	16	First finger nail torn off, also flesh to first joint, in power press.
10	May 2.....	"	"	"	Geo. Miller	25	Thumb of right hand caught in power press; nail and some flesh torn off.
11	" 3.....	"	"	"	Ernest Rymal	14	Second finger of right hand torn some, in trying to take out a can from soldering machine.
12	July 7	"	"	"	Chas. McVey	14	First finger of right hand nail torn off in removing a can from soldering machine in motion.
13	" 26	"	"	"	Harry Dawdy	13	Thumb nail torn off between a pair of rollers.
14	August 24.....	"	"	"	David Scott	16	End of second finger of right hand taken off in a power press.
15	" 30.....	"	"	"	Jas. Forrest	16	Part of first joint of thumb of right hand, cut off by power press, reaching under the die to remove a spoiled cap, put his foot on the starting treadle.

	December 17....	"	"	"	Geo. McKnight, foreman		Fore finger of right hand, under die of stamping press; had to be amputated at first joint; second finger slightly cut.
17	February 5.....	B. Greening Wire Co.....	"	Wire goods	Alf. Jamieson	18	Arm cut by circular saw; removing sawdust while saw in motion.
18	" 13.....	McClary Mfg. Co.....	London	Tinware, etc....	V. Williamson, boy.....	.....	Index finger off in a cutting press at first joint.
19	May 11	"	"	"	Hy. Headford.....	50	Fell down an elevator well nine feet, protected by a bar; elevator out of order; men repairing it; said to have walked in not looking.
20	July 7.....	"	"	"	Geo. Hill.....	15	Tip of thumb taken off by a cutting press.
21	August 20.....	"	"	"	H. Wonnacott.....	16	Face burned by galvanizing material flying from the pot.
22	December 24 ...	"	"	"	John Cowie	.....	Four fingers of right hand caught under die of stamping press; amputated.
23	February 9.....	Hamilton Cotton Co.....	Hamilton	Cottons	John Rogers	.....	First finger off at second joint, second finger at first joint; lost by gears of reel over dye vat.
24	" 26.....	"	"	"	May O'Neil	.....	First finger of right hand partly crushed in gears of stubbing frame, cleaning in motion.
25	" 13.....	R. Whitelaw	Woodstock	Machinery	Jas. Munday.....	18	Right hand run over by iron planer; so injured as to require amputation.
26	May 19	"	"	"	John Stewart.....	.....	Badly burned by explosion of molten brass, supposed to be caused by loaded cartridges in the pot.
27	February 17....	Anthes Mfg. Co...	Berlin.....	Furniture	Wm. Hannam.....	.....	Finger cut on the back by shaper.
28	" 24....	Wm. Simpson	Toronto	Planing and carpentering	Jas. Stewart.....	40	Three fingers of right hand badly cut on back by shaper.
29	" 10....	Massey-Harris Co. (Ltd.)	Brantford	Agri. implements	C. Braitwait.....	21	First finger lost at second joint by drop-hammer.
30	April 18.....	"	"	"	John Lamb..... ..	37	Thumb cut off by buzz planer.
31	June 29..	"	"	"	John Lundy.....	28	First and second fingers of right hand caught between dies of drop-hammer.
32	October 11.....	"	"	"	John Locke	30	Jaw-bone broken by stick thrown from the planer.
33	April 19.....	"	Toronto	"	Geo. Balmer....	20	Finger jammed in a Gordon press (printing department).
34	October 11.....	"	"	"	Hy. Doyle.....	.....	Lost middle and first joint each of first and third fingers of right hand; drop-hammer.
35	May 25	"	Woodstock	"	Jas. Mahoney	....	Thumb and first finger of left hand injured by rip saw; bone of second finger broken.
36	February.	McKinnon Dash Co	St. Catharines..	Dashes, etc.....	— Morris (male).....	17	Small finger off by saw; no business near it.
37	March 1.....	J. Zingsheim	Hamilton	urniture	John Nett.....	.....	Second and third fingers of left hand, tops off, by jointer.

*Fatal

ACCIDENT REPORT.—WESTERN DISTRICT.—*Continued.*

No.	Date.	Employers.	Place.	Business.	Person injured.	Age.	Particulars.
38	March 1	Waterous Engine Works Co	Brantford	Machinery	Walter McCutcheon	18	Arms broken—one in three places; he was putting two-inch belt on pulley on line shaft and was caught and carried around the shaft.
39	April 19	"	"	"	Rodger McKinnon	52	Leg broken; chain of pulley block broke, letting casting fall on his leg.
40	July 7	"	"	"	* Alfred Brown		Killed by being caught in a belt and carried around rapidly revolving shaft.
41	March 7	Noxon Bros. Mfg. Co.	Ingersoll	Agri. implements	Fred. Foster	18	Four fingers of right hand injured by gears of punch, which were guarded.
42	" 12	Goold Bicycle Co.	Brantford	Bicycles	G. Bond	25	Finger partly taken off in back gears of lathe; put his hand too far over in stopping.
43	" 14	Central Press Agency	Toronto	Stereotyping	Arthur Clare	21	Back hurt; fell two flats down elevator shaft; he stepped in, thinking cab was there.
44	August 12	"	"	"	—— Harper	16	Finger end pinched on lead shaver, so as to require amputation.
45	March 12	Greybill Mfg. Co.	Waterloo	Furniture	Nelson Twill	25	Both thumbs cut by band-saw; reported as carelessness; idle two weeks.
46	" 18	J. H. Still	St. Thomas	Handles	Alvine Millard	30	Thumb nearly severed; drawn across a a circular saw by a woolen mitten.
47	" 21	M. B. Perrine & Co	Doon	Twine	Maria Vrooman	21	Right arm caught in machinery while oiling, requiring amputation. It is reported that the belt shifter was accidently moved while her arm was in the machine.
48	" 22	Simpson & Co	Berlin	Furniture	A. Rudy	16	Third and fourth fingers of left hand cut off by the moulder; took off the belt to oil it and went to lift the cap while cylinder still running.
49	" 25	Taylor & Scott	Toronto	Brooms, etc	Wm. Henderson	15	Right hand cut by circular saw, but not seriously.
50	" 21	Bain Bros. Mfg Co.	Brantford	Waggons	R. Storey	40	Two fingers of left hand cut by shaper; not using templet.
51	" 22	E. T. R. Zoellern	Mt. Forest	Furniture	Jas. Thompson		Part of second finger cut off by jointer.
52	June 2	"	"	"	Alex. Robinson		Part of two fingers cut off by jointer, in same machine as above.
53	April 25	Fox & Co	Toronto	Planing, etc	Lendrick Dobson		Right hand and arm mangled by circular saw, requiring amputation near elbow.

54	April 27	J. Ferguson & Sons	London	Furniture	Arthur Drake	34	Thumb ball of left hand torn away by dado knife.
55	" 28	C. Raymond	Guelph	Sewing machines	Peter Walker	43	Hand jammed between grindstone and frame.
56	" 30	Dominion Baby Carriage Co	London	Carriages, etc	Thos. Saunby	17	Thumb of right hand slightly cut by circular saw.
57	"	Withun & Co	Hepworth	Lumber	Hy. Daukert	36	Right arm cut at elbow join by circular saw; reaching under it.
58	"	W. S. Greensides	Mt. Forest	Shingles, etc	A man		Finger cut by butting saw.
59	May 17.	"	"	"	—— McLean	60	Finger off by butting saw.
60	" 3	Newland & Co	Galt	Knitting	Gertrude Harrison		Middle finger first joint crushed; cleaning loom in motion.
61	" 11	Semmens, Ward & Evel	Hamilton	Coffins	Robert Murphy	16	Right hand cut by circular saw; had no business at it.
62	October 25.	"	"	"	Wm. Keith		Little finger of left hand cut by rip saw—circular.
63	May 12	Bell Organ and Piano Co. (Ltd.)	Guelph		Thos. Elliott		Left hand slightly cut by buzz jointer.
64	August 12	"	"		D. McCartney	15	Hand mutilated between rollers of sandpapering machine.
65	May 16	Ontario Tack Co	Hamilton	Tacks	John Murdock	16	Left arm broken at elbow in shifting belt from loose to tight pulley.
66	"	Ideal Washer Co	St. Thomas	Washers, etc	R. C. Williams, foreman		Right eye lost; struck by a stick thrown from a rip saw, breaking the eye-ball.
67	" 20	Stevens, Hamilton & Co	Galt	Machinery	Robert McDonald	17	Tip of third finger of right hand bruised in back gears of lathe, while turning it by hand.
68	July 27	"	"	"	Ed. Scott	20	Two fingers; put his hand in lathe cover, going backwards and into the back gear.
69	May	A. Filshie	Mt. Forest	"	—— Connor	35	Second finger of left hand cut off by circular saw.
70	May	V. H. Carpenter	Grimsby	Baskets	Nat. Durham	50	Two fingers partly cut off by splitting knife.
71	May 31	Watson & Malcolm	Kincardine	Furniture	Wm. Rocket		Three fingers of left hand partly cut off by buzz planer.
72	June 11	"	"	"	Wm. Stalker		Four fingers of left hand partly cut off by buzz planer.
73	August 20	"	"	"	R. J. Tindell		Thumb cut by shaper.
74	June 7	Seaman & Newman	Wiarton	Lumber	Wm. Cutting	45	Part of three fingers of right hand cut off by butting saw, caused by slipping.
75	" 7	London Furniture Co	London	Furniture	Alex. Sutherland		First finger of left hand taken off by rip saw.
76	" 29	"	do	"	Thos. Hinton		Second and third fingers of left hand torn by rip saw.
77	" 8	Anderson & Co	Walkerton	Chairs	Jonathan Hugill	38	Left hand lacerated; saw-table fell pressing hand on idle saw.

* Fatal.

ACCIDENT REPORT.—WESTERN DISTRICT.—*Continued.*

No.	Date.	Employers.	Place.	Business.	Person injured.	Age.	Particulars.
78	July 6	Anderson & Co	Walkerton	Chairs	J. Limbert	19	Needlessly put his finger in the centre hole of the chuck of the lathe; the screw-thread drew his finger in and twisted it off at middle joint.
79	June 12	F. D. Paré	Maidstone	Lumber	* Jos. Anderson		Killed by crossing saw track; stepped on a roller and fell on the splitter saw.
80	"	Porteous & McLagan	Stratford	Furniture	Geo. Duest		Finger of left hand cut by shaper; idle 10 days.
81	" 22	R. Forbes Co. (Ltd.)	Hespeler	Woolens	Belia Hammersby	15	Cleaning spinning frame in motion; sleeve caught in gears, drawing arm in.
82	August 18	"	"	"	Lily Sault	18	Finger crushed in small cogs of spinning frame; carelessly reaching out without looking.
83	June 28	Chas. Rogers & Sons Co. (Ltd.).	Toronto	Furniture	E. Bickell	35	Three fingers cut off by buzz planer.
84	" 30	Can. Col. Cotton Mills Co.	Merritton	Cottons	Hy. Hall	15	Left arm broken—compound fracture—in putting on stripper belt, contrary to orders.
85	Oct. 13	"	"	"	Robert Darling		Finger taken off under chain of roller on cards.
86	June	Ever-ready Dress Stay Co.	Windsor	Stays, etc.	Lily St. Louis	20	Two fingers off at first joint, in a cornering machine for paper boxes.
87	Sept. 14	"	"	"	Jas. Douglass	21	Right wrist jammed in small printing press, after removing its belt.
88	July 20	Toronto Stamping Co.	Toronto	Tin buckles, etc.	—— Robins	14	Two fingers injured by putting his foot on treadle of press at the wrong moment.
89	"	Clinton Organ Co	Clinton	Organs	Chas. Reynolds		Four fingers (two of each hand) cut by buzz planer.
90	"	Broadfoot & Box	Seaforth	Furniture	G. F. S. Garden		Collar bone broken; hit by a stick he was using to put on a belt on an overhead pulley.
91	Sept.	"	"	"	Jas. Davis	14	Right hand injured in sand-papering machine.
92	July 21	Hamilton & Toronto Sewer Pipe Co.	Hamilton	Pipes	Wm. Perrin	23	Thumb cut off; leaning against cylinder of steam (sewer) pipe-press with his thumb in the feed opening, the piston came up cutting it off.
3	"	Strathroy Knitting Co.	Strathroy	Knitting	Man		Face and arms wounded; picker arm broke smashing cylinder cover, splinters struck him.

94	August 2	†Strathroy Knitting Co	Strathroy	Knitting	Maggie Head		Leg broken and badly shaken up.
95	" 2	"	"	"	Lizzie Head		" "
96	" 2	"	"	"	Delia Welch		Two ribs broken.
97	" 2	"	"	"	Hannah Dell		Bruised badly and shaken up.
98	" 2	"	"	"	A. Butler		" "
99	" 2	"	"	"	Esther Davison		" hands burned.
100	" 2	"	"	"	Maggie Boyle		" shaken up.
101	" 5	Ontario Rolling Mills	Hamilton	Forging	H. Develin		Finger off at first joint while shearing a piece of iron, about midnight.
102	" 9	Aaron Gordon	Dresden	Staves	Chas. Roberts		Part of finger cut off by circular saw.
103	September 3	F. J. Wesley & Co	Toronto	Woodenware	*Francis H. Brown	59	Struck on the head by a bursting wood-split pulley, at high speed.
104	" 7	Simcoe Canning Co	Simcoe	Canning	Oscar Lucas		Finger partly off; injured in feed roller of a corn-cutting machine.
105	" 10	Jos. Kidd	Goderich	Barrels, etc	A boy	15	Hand nearly severed by heading jointer saw.
106	" 10	Erie Preserving Co	St. Catharines	Fruit Canning	A girl		Small finger of left hand off; in the knives of a corn cutting machine.
107	" 10	Niagara District Preserving Co	"	"	A girl		Finger cut in the knives of a corn cutting machine.
108	" 10	Can. Col. Cotton Mills Co	Hamilton	Cottons	Geo. Hume		Hand caught in sand rollers of shearing machine, in removing a thread while in motion.
109	" 21	"	"	"	Wm. Greene		Two fingers injured; flesh torn off in removing waste from card screen.
110	" 21	Dresden Canning & Pickling Co.	Dresden	Fruit	Geo. Morden	40	End finger cut off by knives of corn cutting machine or sheller.
111	" 21	Samuel Sloan	Tilbury	Lumber	Arthur Conner	35	Finger badly cut by a rip saw.
112	" 21	London Machine Tool Co	London	Machinery	John McDonald	45	Left arm broken in putting on a belt.
113	" 17	‡Force & Dickinson	Staples	Staves	*John Papineau	54	Killed.
114	" 17	"	"	"	*Mitchell Dupius	40	"
115	" 17	"	"	"	*John Ewing	36	"
116	" 17	"	"	"	*Moses Oulette	40	"
117	" 17	"	"	"	*Jerry Chauvin	23	"
118	" 17	"	"	"	*Lewis Chauvin	21	"
119	" 17	"	"	"	*Peter Daust	22	"
120	" 17	"	"	"	Isaac Beaune	60	Scalded badly.
121	" 17	"	"	"	A. Shilson		Scalded.
122	October 1	J. D. Moore	St. Marys	Planing	Chas. Cottie	27	Small finger of left hand cut off; also hand cut by rip saw.

* Fatal.

† Report of these accidents says, in effect, that the mill took fire about five o'clock p. m., on August 2nd, and these seven girls working on fourth or top flat had time to get out by the eastern tower stairs, but delayed in changing shoes and by other matters till too late to use stairs, and had to jump from windows.

‡ One of the boilers in this mill exploded shortly before seven o'clock in the morning (starting time). Nearly all of the injured persons were near the furnace getting warm, as the morning was chilly. A corner's inquest was held, but no blame was attached to the fireman, two of whose sons were killed. The opinion by an expert, who made an examination after the inquest, is that the boiler when new was a good one, but had corroded away about one-half its thickness, under the brick covering, by a leak under the dome.

ACCIDENT REPORT.—WESTERN DISTRICT.—*Concluded.*

No.	Date.	Employers.	Place.	Business.	Person injured.	Age.	Particulars.
123	October 21.....	Clark & Carman....	St Marys	Flax	John Keen.	18	Left arm torn off just below shoulder. He was carrying a bundle of flax on his back, rested it on a revolving shaft (going 150 revolutions), about three feet from the floor; some fibres wound around the shaft, and he did not let go his hold of the bundle in time to escape injury.
124	November 5....	Wm. Clark.....	Flamboro'.....	Woolens	*Catharine Maloney....	37	Dress wound around upright shaft in dye-house, and was instantly killed; girls had orders not to go into the dye-house.
125	" 5....	Kerr & Harcourt	Walkerton	Bobbins.....	Geo. Black	17	Middle finger of left hand cut by circular saw.
126	" 24....	S. J. Moore.....	Hamilton	Machinery	John Tompkins.....	21	Part of finger of left hand off; jammed in iron planer; altering stroke in motion.
127	December 3....	Port Elgin Brush Co.....	Port Elgin	Brushes	C. Allison	15	Part of left thumb cut off by tampico knife.
128	" 24....	Hamilton Bridge Co.....	Hamilton	Bridges, etc	Jos. Connors	21	Right arm broken in two places, and left leg broken; clothing caught by set screw on mandrel of Radial Countersink Drill.

* Fatal.

ACCIDENT REPORT FOR 1892.—CENTRAL DISTRICT.

No.	Date.	Employer.	Place.	Name of Person injured.	Age.	Particulars.
1	March 22.....	R. Parker & Co	Toronto	*Alfred J. Roberts	33	Burned by explosion of benzine. Died 1st April following.
2	June 18	Burton Brothers.....	Byng Inlet.....	*Patrick McNeil	$14\frac{7}{12}$	While riding on saw carriage, he lost his balance as he was pulling the spring lever back, and swung over in front of the five-foot circular saw, and killed instantly. He was not at his own work.
3	July 22	Taylor Brothers	Don Valley, Toronto.	*James Woolings.....	16	Went to put belt on pulley; kicked belt with his foot, which was caught in loop of belt. Left foot torn off at ankle. Died 30 hours after the accident.
4	" 6	Murray Brothers	North Bay	*Arthur Ashton	16	Deceased went on slash table while saws were in motion to clear two saws which were stopped. In removing a piece of wood which had caused the stoppage, he stumbled on the centre saw. Left thigh cut. Died twenty-four hours after the accident. He was an orphan from England.
5	April 7	Quirt & Co	Eagle Lake	*Alex. Millsap	27	Fly wheel of engine burst, killing him instantly.
6	Oct. 25.....	Standard Woollen Co.....	Toronto.....	*Edward Getchel.....	38	While adjusting cloth on frame in tank of boiling dye, he overreached himself, and his foot slipping he fell in. Died the following day.
7	Jan. 6.....	Canadian Genl. Electric Co	Peterboro'.....	T. Dorris	18	First joint of one finger on left hand cut of on power punch.
8	" 11.....	Trent Valley Woollen Co	Campbellford...	M. Fraser...	18	Putting her hand in cog-wheel while in motion; one finger pinched at end.
9	" 14.....	Stephen A. Lazier.....	Belleville.....	Benjamin Howell	35	Arm broken by belt lapping round shaft.
10	" 20	Ontario Rolling Mills Co.....	Swansea	Robert Payne	.....	Fell down stairs and sprained ankle.
11	" 21.....	Canadian Genl. Electric Co.....	Peterboro'.....	J. W. Doxwell	45	Two fingers of right hand cut about quarter inch off ends on circular saw.
12	" 23.....	" "	"	James Steele	28	Second finger of right hand taken off at first joint by armature slipping off truck and catching his hand.
13	Feb. 22	Standard Woollen Co.....	Toronto.....	Sydney Liscum	13	Forefinger lacerated in gear of carding machine.
14	" 25.....	Canadian Genl. Electric Co.....	Peterboro'.....	F. McMaster.....	18	First finger of left hand taken off at first joint on power punch.
15	March 5.....	Dominion Cotton Co.....	Kingston.. ..	Maggie Pearle.....	14	Finger caught between two small rollers; slight.
16	" 8.....	Canadian Genl. Electric Co	Peterboro'.....	R. W. Carson	30	While rolling large pot; muscles of leg badly strained.
17	" 10.....	Kemp Mfg. Co	Toronto.....	Edward Reid	18	Finger cut off; caught under die of power press.
18	" 14.....	The Rathbun Co.....	Deseronto.....	George Aikes.....	40	Hand caught between block and carrier in shingle mill; hand mashed, one finger broken.
19	" 15.....	James Hamilton.....	Lindsay	James McWilliams	45	Forefinger cut off and thumb slightly cut on buzz planer.
20	April 7.....	James Smart Mfg. Co	Brockville.....	Ancle Gamble.....	19	Putting belt on planer; wrist sprained and two fingers bruised.
21	,, 21	The Polson Iron Works Co.... .	Toronto.....	Charles E. Hibbert	.....	Hand caught in gear of crane; three fingers of left hand cut off.

*Fatal.

ACCIDENT REPORT.—CENTRAL DISTRICT.—*Continued.*

No.	Date.	Employer.	Place.	Name of Person injured.	Age.	Particulars.
22	April 22	Kemp Mnfg. Co	Toronto	Joseph Newman	23	Thumb and first finger caught under die of power press.
23	" 23	The Rathbun Co	Deseronto	Joseph Marlow	28	Slab thrown from circular saw; bowels bruised.
24	" "	Hanover Furniture Co	Hanover	Alex. Linnel	...	Point of finger taken off by buzz-planer.
25	" 29	William Donnell	Peterboro'	George Tremain	22	Flesh cut on hand by circular saw.
26	May 2	J. C. Scott	Toronto	Wm. Hunt	17	Falling on circular saw; arm badly cut.
27	" 7	Napanee Cement Co	Napanee Mills	Nelson Shannon	46	Caught on carrier belt; left arm broken between wrist and elbow.
28	" 19	Miller Brothers	Glen Miller	Thomas Long	24	Flesh of leg badly lacerated in gear.
29	" 21	Geo. E. Hilliard	Peterboro'	William Long	17	Hand caught between crank shaft and lever of loom; a deep flesh wound on hand.
30	" "	The Rathbun Co	Deseronto	Ephraim Masten	21	Hand slipped on circular saw; flesh wound on hand.
31	" 30	Jas. Smart Mfg. Co	Brockville	John Cumbers	15	Hand lacerated with handling steel.
32	" "	Peter Hamilton	Peterboro'	David Lewis	45	Four fingers of left hand cut off by drop hammer.
33	"	Mickle, Dyment & Co	Gravenhurst	James Patterson	35	While turning face of pulley, bar caught, striking him on jaw.
34	June 2	Wm. Cane & Sons Mfg. Co	Newmarket	Albert Trivett	23	Hand slipped on drum saw; finger amputated.
35	" 4	P. W. Ellis & Co	Toronto	Frank Loach	24	Hand caught in engine and crushed.
36	" 9	Joseph Simpson	"	Sidney Bryant	15	Finger caught in gear and lacerated.
37	" 15	Spanish River Lumber Co	Spanish River	John Andrews, jr	30	Plank thrown from circular saw; left leg broken near hip.
38	" 21	Jas. Smart Mfg. Co	Brockville	John Cotton	35	Accidentally struck bottom of cupola with bar, causing it to fall on his right foot.
39	" 24	Joseph Simpson	Toronto	Francis Carrigan	23	Hand slipped in vat of boiling dye; hand scalded.
40	" 25	Wm. Cane & Sons Mfg. Co	Newmarket	Charles Smith	57	A portion of finger cut off on circular saw.
41	" 28	Ontario Rolling Mills Co	Swansea	J. Dutnall	.....	While shearing scrap iron, bar caught, bruising his leg badly.
42	"	North American Bent Chair Co.	Owen Sound	E. Hart	17	Second, third, and fourth fingers of left hand cut off at second joint on circular saw.
43	"	Murray Brothers	North Bay	Joseph J. Davis	50	Points of two middle fingers of left hand cut off on buzz planer.
44	July 8	Trent Valley Woollen Co	Campbellford	Norman Hubble	18	While sewing a belt right arm was caught and broken; arm amputated.
45	" 9	R. S. Williams & Co	Oshawa	Albert Dyer	15	While playing with sand-papering wheel; left hand severely injured.
46	" 21	Wm. Cane & Sons Mfg. Co.	Newmarket	George Hughes.	24	Finger caught in circular saw; piece taken off side of finger.
47	" 27	M. Brennan & Sons	Sundridge	Wm. Taten	24	Three fingers badly cut on circular saw.
48	"	John Holbert	Burk's Falls	Henry Lush	22	Two fingers of left hand cut off at first joint on circular saw.
49	August 1	Johnston Brothers	Peninsula Lake	Willard Thompson	22	Head came in contact with circular saw; scalp wound.
50	" 2	Imperial Lumber Co	Warren	Wm. Montgomery	19	Going on slash table, he backed up on one of the saws; cut on side of foot.

51	Aug.	4	The Rathbun Co	Gravenhurst	James Simpson	50	Hand cut between thumb and forefinger on cross-cut saw.
52	"	5	The Toronto Furnace Co	Toronto	James Moore	45	While moulding, box fell on leg; leg broken.
53	"	"	Kemp Mfg. Co	"	Wm. Carpenter	21	First finger on right hand and second finger on left hand cut off at first joint on power press.
54	"	9	Lakefield Lumber Co	Lakefield	Edward Quin	35	Struck on groin with piece of edging with which he was putting belt on pulley.
55	"	12	Beardmore & Co	Toronto	Annie Beswetherick	27	Dress catching on shaft; very slight bruise on leg.
56	"	19	George Gillies & Co	Gananoque	Francis Hawke	65	Hand caught in belt; arm and wrist cut.
57	"	20	Wm. Cane & Sons. Mfg. Co	Newmarket	Stephen Stewart	30	Two fingers cut off on circular saw.
58	"	24	Christie, Brown & Co	Toronto	Wm. McHarg	65	Elevator descended while he was cleaning out bottom of shaft; back strained.
59	"		A. J. Miller & Co	Picton	Claudius Young	18	Little finger cut off on corn cutter.
60	Sept.	13	Ontario Rolling Mills Co	Swansea	Patrick Sullivan		Leg burned and cut very badly, coming in contact with a piece of red hot iron.
61	"	"	Napanee Cement Co	Napanee Mills	Robert James Pybus	23	Finger crushed by building stone falling on it.
62	"	15	" "	" "	John Pierson	31	Ankle badly sprained, stumbling from plank.
63	"	16	Miller Brothers	Glen Miller	James Horricks	13	Thumb crushed in gear and cut off.
64	"	20	Wm. Cane & Sons Mfg. Co	Newmarket	George Dowson	17	Fell against circular saw; arm amputated at elbow.
65	"	26	Cobourg Woollen Co	Cobourg	Kate Adams	17	Two fingers of right hand cut off close to hand by gear of mule.
66	"	27	Napanee Cement Co	Napanee Mills	George Stinson	32	Second and third fingers of right hand crushed by iron bracket falling thereon.
67	"	28	The Rathbun Co	Deseronto	Frank Early	18	Finger cut off at second joint on circular saw.
68	"	29	" "	"	Willoby Reynolds	18	Little finger cut off at knuckle on circular saw
69	"	30	" "	"	Richard Cole	15	Third finger cut off at first joint on circular saw.
70	Oct.	3	Victoria Harbor Lumber Co	Victoria Harbor.	Donald McMillan	29	Three fingers of right hand lacerated on circular saw.
71	"	"	The Rathbun Co	Lindsay	Thos. Donaldson	21	Left arm cut by board thrown from circular saw.
72	"	5	Globe File Co	Port Hope	Thos. E. Burt	23	Flesh ground off two or three fingers of left hand on grindstone.
73	"	11	Longford Lumber Co	Longford	Wm. McRae		Right arm torn off above elbow, putting on belt.
74	"	13	Kemp Mfg. Co	Toronto	Fred. Weller	19	First finger of right hand cut off at first joint on power press.
75	"	"	Gibhard Furniture Co	Napanee	Neil Mathewson	40	Finger partly cut off on shaping machine.
76	"	20	Christie, Brown & Co	Toronto	Edward Graham	25	Toes crushed under mixer platform in its descent.
77	"	26	Gilmour & Co	Trenton	Joseph Cormier	20	Little finger cut off and three others badly injured on circular saw.
78	Nov.	2	Kemp Mfg. Co	Toronto	Fred Johnson	17	First finger of right hand cut off at first joint by power press.
79	"	4	Canadian General Electric Co	Peterboro'	Percy Byshe	18	Thumb cut off at first joint on milling machine.
80	"	7	" " "	"	Charles Huffman	32	The tips of two fingers cut off on circular saw.
81	"	5	Oshawa Malleable Iron Co	Oshawa	A. Jacobi	35	Finger jammed on drop press.
82	"	7	" " "	"	Oliver Finkel	24	Finger injured on shears.
83	"	11	M. Brennan & Sons	Sundridge	John C. Davidson	50	Hand caught between pulley and paper friction; arm amputated.
84	"	"	S. McAdams	South River	Thos. Kernick	32	Laying hand on circular saw; fingers cut.
85	"	17	Gibhard Furniture Co	Napanee	Frank W. Davidson	30	Four fingers about half taken off on buzz-planer.
86	Oct.	29	Cobourg Woollen Co	Cobourg	Edward Ibbotson	15	Arm lacerated in carding machine, while cleaning same in motion.
87	Nov.	26	" "	"	Mary Ibbotson	20	Cleaning twisting machine while in motion; end of finger crushed in gear.

ACCIDENT REPORT.—CENTRAL DISTRICT.—*Concluded.*

No.	Date.	Employer.	Place.	Name of Person injured.	Age.	Particulars.
88	Nov. 28	W. & J. G. Greey's	Toronto	Joseph Ratelle	35	Thumb and two first fingers of right hand cut off on wood shaping machine.
89	Aug. 25	Brockville Wringer Co	Brockville	Wm. Patterson	17	Arm lacerated while cleaning away blocks under a saw.
90	Nov. 11	Knechtel Furniture Co	Hanover	Valentine Lensing	50	One finger cut off at first joint on left hand, and thumb and three other fingers cut more or less on buzz planer.
91	Dec. 3	Brockville Carriage Co	Brockville	John Ross	21	First finger cut off at first joint on buzz planer.
92	" 10	Joshua Walshaw	Bolton	George Ward	17	Fell against finisher cards; shoulder and arm badly lacerated.
93	" 15	Wm. Cane & Sons Mfg. Co	Newmarket	James Gibson	24	Flesh cut on finger by circular saw.
94	" 21	Consumers Gas Co	Toronto	George Leslie	....	Fell in hole on platform of new retort house.
95	" 28	Canadian General Electric Co	Peterboro'	E. Brown	18	Point of thumb on right hand cut off on power press.
96	" 13	" " "	"	Ed. Maher	40	Piece of emery got in left eye while grinding brass casting; off work five weeks.
97	" 15	Polson Iron Co	Toronto	Ed. Garvin	19	Shirt sleeve caught in pinion of crane; body bruised and leg cut.

ANNUAL REPORT

OF THE

INSPECTOR OF DIVISION COURTS

FOR THE

PROVINCE OF ONTARIO

FOR THE YEAR

1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
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1893.

ANNUAL REPORT

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FOR THE YEAR 1892.

OFFICE OF THE INSPECTOR OF DIVISION COURTS,
PARLIAMENT BUILDINGS, TORONTO, 31st December, 1892.

To His Honor
THE HON. G. A. KIRKPATRICK,
Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOR:

I have the honor to submit the following report upon the Division Courts of the Province for the year ending 31st December, 1892.

CONTENTS.

In table A. will be found a full return of the Division Court business of the year, alphabetically arranged for Counties and Districts, and carefully tabulated under convenient headings for each court.

Table B. supplies a complete list of the Division Court Clerks, the post-office address of each, the numbers of the respective courts, and county or district in which situated—corrected up to the sending of this report to press.

Table C. supplies similar information with respect to Bailiffs.

Table D. gives the different courts and the limits of the respective divisions—including latest changes.

The tariff of fees to be received by clerks and bailiffs is appended.

Number of Suits—Amount of Claims.

There were entered, according to table A., 53,029 suits, for claims amounting to a total of $2,121,631, exclusive of transcripts of judgments and judgment summonses.

Received and Paid.

The total amount of suitors' moneys received was $696,467.70, and the total paid out $690,516.27, leaving to the credit of suitors (including balances from previous years) $38,673.84.

Revenue.

The percentage upon fees and emoluments of clerks paid into the Provincial Treasury amounted to $6,865.06.

Appointments—Resignations, etc.

During the year there were twenty-eight new appointments of clerks, and thirty-six appointments of bailiffs, to fill the same number of vacancies, caused by resignations, deaths and removals.

Leave of Absence—Deputies.

Papers granting leave of absence for varying short periods were made out and transmitted to forty-eight clerks and twenty-nine bailiffs,—and the approval of the appointment of their deputies—shewing a remarkable decrease in the number of these applications compared with the previous year, when 58 clerks and 53 bailiffs applied for and obtained leave of absence.

New Seals.

New seals were supplied two courts during the year; last year seals were required for six courts, to replace those worn out.

Complaints.

Whilst there is no diminution in the aggregate of the number of complaints against clerks and bailiffs, I am pleased to be able to report that there is quite an observable decline in the number of the complaints of a more serious character—neglect of duty in not making more prompt returns—forming the great bulk of the 237 complaints against clerks and 261 complaints against bailiffs sent into the Department during the year. The cases of withholding suitors' moneys have been comparatively few. Neglect in not giving information asked for by letter, collecting on commission, making charges outside the Tariff, and not notifying the parties entitled thereto, when moneys paid into court, are the other principal charges made against clerks and bailiffs. In a few cases of special complaints made against bailiffs for neglect in executing warrants of commit-

ment, it was found that the warrant had been stayed, without the knowledge of the complainant, thus of course exonerating the officer, but at the same time leading to some inconvenience for want of notice to the judgment creditor. I respectfully submit that notice of such applications should be given to the parties entitled, and that bailiffs should not be permitted to obtain stays of such warrants upon their own mere motion and without proper authority, in writing, to be submitted to the Judge. Not a few of the complaints made were found upon examination to be without any just foundation, and satisfactory explanations were given in answer to others, when investigated. In all cases prompt enquiry followed upon every complaint, and as the files of the office continue to bear testimony, with the best results to suitors.

Covenants.

Close attention has been given, as far as the authority of the Inspector would permit, in ascertaining that proper security had been entered into by clerks and bailiffs, and that the existing covenants filed in the offices of the Clerks of the Peace were sufficient. To this end, not only have the particulars of covenants been required from officers, but the production of the certificate of filing of the Clerk of the Peace, for examination, has been also insisted upon, and the offices of the Clerks of the Peace visited, and the covenants filed therein systematically inspected, when the Inspector visits a county town. These precautions, it is to be hoped, will prove not only a greater protection to the public, but will prevent the filing of irregularly executed covenants. In this connection, it is necessary that the renewal receipts for premiums on the bonds given by Guarantee Companies should be regularly filed, as received, with the covenants; and this I insist upon being done in all cases which come under my notice.

Inspection.

The personal inspection of offices made by me occupied the greater portion of my time during the year, and necessitated much and constant travelling from point to point all over the Province. I am pleased to be able to report that in most of the offices visited I found a noticeable improvement in the keeping of the books, in making the entries therein correctly, and in the orderly classification and preservation of the court papers—which I have always made it part of my duty to insist upon. On the whole, I am enabled to report that I have found a general improvement in the discharge of their duties by the officers of the courts, and an encouraging desire to co-operate in carrying out my suggestions and the requirements of the law.

In the several cases specially reported on during the year, searching investigations were held, and the evidence submitted with the reports, as taken at length.

Correspondence.

The growth of the correspondence still continues; all communications are, however, answered with promptitude, and the required information given upon all questions submitted, especially in connection with the practice of the courts, the court officers and their duties. Letters of thanks are being constantly received from suitors, the profession, and from clerks and bailiffs themselves for the assistance rendered them, and testifying to the great value of the Department in these respects, and as also affording the public at once a ready means of redress and prompt information upon all Division Court matters.

Court Books.

The necessary books required by clerks and bailiffs of the Unorganized Districts are now supplied, to a limited amount, by the Government, where their emoluments do not exceed $500 per annum—thus placing them upon an equal footing with the officers of courts of the settled county municipalities, whose books have to be provided at the expense of the county. Care is taken that all applicants are not supplied as a matter of course. It is required that the books in use must be made available as far and as long as possible, and that only such as are indispensable are provided.

Entering Returns.

In not entering returns promptly as made by their bailiffs, some few clerks have been found rather neglectful. The practice is not only slovenly, but bad in itself, leading to mistakes and trouble, and its immediate discontinuance has been strenuously insisted upon whenever detected.

Moneys in Court.

Another duty, which in the course of inspection I found to have been overlooked to some extent, is the listing of moneys remaining in court. Section 49 of the Division Courts Act makes it imperative that the clerk of every Division Court shall annually, in the month of January, make out a correct list of all sums of money belonging to suitors in the court, which have been paid into court and have remained unclaimed for six years. This list should specify the names of the parties for whom, or on whose account the moneys were paid, and a copy should be put up, and remain posted at all times, in the clerk's office, and, during court hours, in some conspicuous part of the courthouse or place where the court is held. If no money remains unclaimed, the fact should be stated by affidavit.

Duty of Clerks.

I have here only to reiterate the opinion expressed in my former reports, that bailiffs' should be vigilant in making return to process or execution within the proper time, and that where it is not done the forfeiture of fees should be exacted by the clerk. And here I beg particularly to direct the attention of clerks to sec. 57 of the Division Courts Act, which points out their duty in this respect.

In conclusion, I have much pleasure in referring to the stricter compliance with the law observed by clerks and bailiffs in sending in their annual returns for the past year, and which enables me to submit, and have printed, this my annual report at a much earlier period of the year than heretofore.

I have the honour to be

Your Honor's obedient servant,

J. DICKEY,

Inspector.

TABLES.

TABLE A.

RETURN of Division Court Business from the first day of January to the thirty-first day of December, A.D. 1892, inclusive, shewing:—

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents Fees under section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.	$	c.		$	c.
Algoma ..	1	88	3650	82	9	421	29	4	306	74	649	59	590	61	58	98	5														
	2	46	2225	83	1	18	31	1	8	62	723	89	223	33	56		5														
	3	107	4588	01	1	157	16	10	42	78	1231	39	1221	70	52	47	8														
	4								25	85	820	10	811	75	34	20															
	5																														
	6	39	1044	36	1	141	19																								
Brant	1	559	26607	47	40	2369	50	69	8796	28	8648	19	148	09	80		11	1	6	61	00		32	63	42	34	6	33	00	
	2	154	4810	11	7	237	67	13	1980	02	1980	29	17	35	7								4	51			2	11	00	
	3	46	1558	85	2	102	52	2	795	34	795	34											1	88						
	4	83	2536	33	8	314	75	2	57	83	917	27	945	36	28	94	4	1	2	23	00		2	44						
	5	26	1184	10	4	133	31	4	76	08	344	76	399	34	21	40	5	3	1	12	00		1	61						

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties, or District.	Number of Divisions.	Number of Suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $160.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 183 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Acts," 1880.	Amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.							$ c.	$ c.		$ c.
Algoma ..	5	280	11509 02	18	737 95	15	105 24	3424 97	2847 39	146 21	18	....	1	....	....	....	5 89	....	....	10 00
Brant	5	868	36696 86	61	3157 75	90	448 47	12842 67	12768 52	215 78	96	15	1	9	96	....	43 07	42 34	8	44 00
Carried forward.	10	1148	48205 88	79	3895 70	105	553 71	16267 64	15615 91	361 99	114	15	2	9	96	....	48 96	42 34	10	54 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Juriors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agent's Fees under Section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Bruce....	1	238	7312 69	19	1108 64	9	344 97	2846 02	2872 00	319 09	13	2		1	12 00	....	7 36		1	5 00
	2	182	3442 60	5	.....	4	150 00	1695 01	1791 85	53 19	4	....		....	.....	....	2 86	.....	.....	.....
	3	78	3000 35	11	411 36	8	70 37	1346 18	1167 59	248 96	6	....		....	.....	....	3 06	.....	.....	.....
	4	151	6008 42	5	127 67	4	62 50	2123 21	2133 33	78 12	11	....		1	12 00	....	5 72	.....	.....	.....
	5	98	4342 21	15	981 34	5	359 42	1271 08	1242 26	28 82	15	....		....	.....	....	5 07	.....	1	5 00
	6	41	1463 73	4	127 36	2	51 77	751 45	774 45	28 77	3	....		1	11 00	....	1 41	.....	1	10 00
	7	96	4732 63	6	155 43	8	....	986 68	986 68	.....	10	....		1	12 00	....	4 84	.....	1	5 00
	8	320	8709 36	90	3795 06	13	.....	3575 76	3474 57	101 19	17	....		....	.....	....	9 74	.....	.....	.....
	9	108	2097 65	1	17 55	4	.....	832 28	812 83	19 45	7	....		....	.....	....	2 86	.....	1	10 00
	10	51	2179 85	16	918 72	4	39 00	492 08	464 83	66 25	4	....		....	.....	....	2 11	.....	.....	.....
Carleton..	1	1498	65875 73	31	2084 20	678	765 24	11872 14	12429 75	207 03	144	6	....	....	.....	2	68 24	1103 70	8	41 00
	2	55	1576 39	7	196 52	7	.....	1206 02	1206 02	.....	3	....	....	....	.....	....	1 68	.....	.....	.....
	3	75	2147 57	7	612 56	....	.....	1770 60	1770 60	.....	....	....	....	....	.....	....	2 01	.....	.....	.....
	4	66	2768 00	19	974 00	14	18 00	2417 00	2410 00	26 00	4	....	....	....	.....	....	2 41	.....	3	25 00
	5	40	2003 44	7	302 84	2	.....	1010 01	1010 01	.....	6	2	....	1	12 00	....	2 19	.....	1	5 00
	6	38	1428 71	9	485 98	3	.....	613 67	613 67	.....	4	....	....	....	.....	....	1 60	.....	.....	.....
	7	72	1846 74	6	347 55	19	41 46	730 31	643 91	127 86	1	....	....	....	.....	....	1 46	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
							$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward.	10	1148	48305 88	79	3895 70	105	553 71	16267 64	15615 91	361 99	114	15	2	9	96 00	....	48 96	....	....	....
Bruce	10	1313	44188 28	172	7646 13	61	1078 03	15919 78	15720 39	943 84	90	2	2	4	47 00	....	45 03	.....	10	54 00
Carleton..	7	1844	77946 58	89	5003 65	723	824 70	19649 75	20083 96	361 49	162	8	.....	1	12 00	2	78 99	1103 70	12	71 00
Carried forward.	27	4305	170340 74	340	16545 48	889	2456 44	51837 17	51420 26	1667 22	366	25	4	14	155 00	2	172 98	1146 04	27	160 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of Claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Dufferin ..	1	303	12465 56	19	1305 93	28	162 39	3097 67	3168 31	91 92	21	2	....	2	21 00	....	12 24	....	1	10 00
	2	216	9832 06	38	1525 26	44	.....	2351 35	2338 35	13 00	27	....	....	1	12 00	....	11 47	....	2	15 00
	3	91	3617 69	25	1229 00	11	232 37	1408 53	1578 09	62 81	10	....	....	....	.....	....	3 91	.....	.....	.....
	4	41	1469 06	8	196 35	...	88 04	652 21	618 12	34 12	2	....	1	....	.....	....	1 46	.....	.....	.....
	5	178	5921 37	9	841 75	12	.....	1302 86	1302 86	.....	10	....	1	3	24 00	....	5 41	.....	.....	.....
Elgin	1	265	10456 21	42	1735 20	42	259 92	5622 93	5742 12	8742 12	24	1	.....	3	33 00	....	12 33	.....	1	10 00
	2	61	2619 42	15	773 41	11	69 79	1004 39	921 24	152 94	5	1	1	1	6 00	....	2 30	.....	.....	.....
	3	537	18007 03	22	1116 89	73	106 84	5621 81	5635 39	293 26	29	....	.....	....	.....	....	16 01	4	4	29 00
	4	417	9715 49	35	1452 95	45	173 46	4766 17	4701 60	238 03	12	3	.....	1	11 00	....	7 75	21 58	5	27 00
	5	217	8130 55	12	460 06	41	60 95	3990 26	3956 19	34 07	16	....	.....	....	.....	....	8 20	6 30	.....	.....
	6	102	3494 84	10	610 36	16	52 13	1953 31	2000 22	5 22	5	4	.....	1	12 50	....	3 08	.....	1	3 00
	7	679	24891 36	25	1327 72	95	166 23	7761 63	7839 18	88 68	49	8	3	1	12 00	....	23 41	113 04	3	13 00
	8	215	9188 96	18	829 30	59	141 82	3257 27	3196 45	202 64	14	....	1	....	.....	....	6 98	.....	1	5 00
	9	185	5638 66	17	820 98	64	38 18	2652 79	2652 79	38 18	11	2	.....	2	12 00	....	7 13	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.	
Brought forward .	27	4305	170340	74	340	16545	48	889	2456	44	51837	17	51420	26	1667	32	366	25	4	14	155	00	2	172	98	1146	04	27	160	00
Dufferin ..	5	829	33335	65	99	5098	29	95	462	80	8812	65	9005	73	201	85	70	2	2	6	57	00		34	52	.....		3	25	00
Elgin	4	1280	46798	15	114	5078	46	171	610	01	17015	30	17000	35	9426	35	70	5	1	5	50	00	....	38	49	27	88	10	66	00
Essex	9	2017	70809	91	109	5260	87	468	1076	02	26294	47	26199	20	1110	34	131	15	5	5	43	50	....	67	09	113	04	9	36	00
Carried forward .	45	8431	315284	55	662	31983	10	1623	4605	27	103959	59	103625	54	12405	86	647	47	12	30	305	50	2	313	08	1286	96	49	00	287	00

RETURN of Division Court Business.—*Continued*

	The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of suits entered, where the amount claimed exceeds $100.	Number of actions for Tort where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 16 of "The Division Courts Acts, 1880."	The amount of costs so taxed.
				$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
	Frontenac	1	569	26873 95	25	1011 03	89	797 45	9835 07	10078 44	554 08	67	3	1	2	14 00	....	28 72	70 80	6	40 00
2		2	23	583 31	5	280 06	6	63 35	305 35	336 10	33 10	1	....	....	....	....	....	55	....	....	....
3		3	32	1082 41	5	29 75	1	....	359 10	339 41	19 69	1	....	....	....	....	....	94	....	....	....
4		4	113	2834 01	3	129 77	26	....	791 42	781 42	10 00	5	....	1	....	....	....	2 79	....	....	....
5		5	28	939 03	2	40 98	1	....	222 25	222 25	....	2	1	....	....	....	....	1 01	....	....	....
6		6	158	7212 82	7	630 82	34	16 75	818 29	821 52	13 52	16	....	....	....	....	....	7 12	....	1	10 00
1	Grey	1	549	23335 82	59	3093 01	261	....	6665 00	6643 00	22 00	46	3	....	....	....	....	21 91	123 58	7	41 00
2		2	158	5103 08	18	1179 64	31	49 73	3463 51	3487 99	25 28	8	1	....	....	....	....	4 70	....	4	25 00
3		3	209	9246 91	5	196 86	70	36 72	2907 51	2907 51	36 72	21	2	....	....	....	....	9 21	....	5	38 00
4		4	96	5450 30	24	1853 61	23	23 61	2065 57	2005 65	23 53	25	1	....	....	....	....	5 53	....	5	35 00
5		5	199	7546 37	27	1610 16	29	102 09	2818 12	2905 13	15 08	12	1	1	1	11 00	....	6 93	....	2	8 00
6		6	81	2942 18	12	411 12	17	17 29	1579 78	1582 63	14 44	4	1	....	....	....	....	2 41	....	1	8 00
7		7	140	4174 00	14	809 45	4	....	2393 21	2393 21	....	4	....	....	....	....	....	3 56	....	....	....
8		8	90	4173 58	4	141 11	14	....	1742 14	1742 14	....	13	....	....	2	22 00	....	4 72	....	1	5 00

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney, or Agents' Fees under section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
Brought forward.	45	8431	315284 55	662	31983 10	1623	4605 27	103959 59	103625 54	12405 86	647	47	12	30	305 50	2	313 08	1286 96	49	287 00
Frontenac	6	923	39525 53	47	2122 41	157	878 05	12331 48	12579 14	630 39	92	3	2	2	14 00	....	41 13	70 80	7	50 00
Grey	8	1522	61992 24	163	9284 96	449	229 44	23574 87	23667 26	137 05	133	9	1	3	33 00	....	59 00	123 58	25	160 00
Carried forward.	59	10876	416802 32	872	43390 47	2229	5712 76	133865 94	139872 94	13173 30	872	59	15	35	352 50	2	413 21	1481 34	81	497 00

RETURN of Division Court Business.—*Continued*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Haldimand ..	1	39	1448 24	6	352 15	2	28 00	636 02	664 02	.....	6	3	.....	.....	24 00	....	1 54	.....	1	10 00
	2	36	1818 16	6	252 31	1	25 00	436 66	408 66	28 00	4	.....	.....	.....	.....	.....	1 93	.....	.....	.....
	3	128	4809 73	9	343 72	8	163 68	2467 72	2555 86	75 54	13	.....	.....	.....	.....	.....	5 32	.....	.....	.....
	4	27	987 33	4	251 46	....	.....	497 97	497 97	.....	1	1	.....	.....	.....	.....	1 13	.....	.....	.....
	5	23	629 79	3	95 25	....	.....	345 31	345 31	.....	.....	.....	.....	.....	.....	.....	39	.....	.....	.....
	6	120	5674 50	27	1274 40	9	138 26	2742 99	2801 04	80 21	15	.....	.....	1	12 00	....	6 24	.....	.....	.....
Haliburton ...	1	57	2313 51	9	357 10	4	20 00	592 30	609 99	2 31	5	.....	1	.....	.....	.....	2 36	.....	.....	.....
	2	66	1835 36	2	99 80	3	....	725 19	725 19	.....	1	.....	1	.....	.....	.....	1 30	.....	.....	.....
	3	23	564 32	8	560 25	2	4 50	412 83	417 33	.....	.....	.....	.....	.....	.....	.....	36	.....	.....	.....
Halton ..	1	113	4555 77	13	743 62	25	201 41	1844 25	1759 75	245 89	9	.....	.....	.....	.....	.....	4 65	.....	.....	.....
	2	117	5828 06	8	95 73	7	47 69	2834 67	2823 62	11 05	21	.....	.....	.....	.....	.....	7 47	.....	.....	.....
	3	128	4426 81	4	279 94	48	31 43	1786 45	1817 88	.....	11	.....	.....	.....	.....	.....	4 46	.....	.....	.....
	4	76	1613 80	8	378 00	12	18 40	492 30	471 56	39 11	1	.....	.....	1	.....	.....	1 09	.....	.....	.....
	5	33	1408 80	9	540 00	2	....	437 20	437 20	.....	2	.....	.....	.....	.....	.....	1 32	.....	.....	.....
	6	93	3389 03	5	280 31	10	4 57	1559 05	1558 62	5 00	6	.....	.....	.....	.....	.....	2 70	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents Fees under section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.	
			$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.	$	c.		$	c.
Brought forward.	59	10876	416802	32	872	43390	47	2229	5712	76	139865	94	139872	94	13173	30	772	59		35	352	50	2	413	21	1481	34	81	497	00
Haldimand...	6	373	15357	75	55	2569	29	20	354	94	7126	67	7272	86	183	75	30	4	1	3	36	00		16	55			1	10	00
Haliburton	3	146	4743	39	19	1017	15	9	24	50	1730	32	1752	51	2	31	6		2					4	02					
Halton ..	6	560	21222	27	47	2317	60	104	303	50	8953	92	8868	63	301	08	50						1	21	69					
Carried forward.	74	11955	458135	73	993	49294	51	2362	6395	70	157676	85	157766	94	13660	44	867	63	18	38	388	50	3	455	47	1481	34	82	507	00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 16 of "The Division Courts Acts," 1880.	The amount of costs so taxed.
				$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Hastings..	1	336	14902 00	2054 17	28	95 79	31	5700 57	5309 97	390 60	34	....	....	....	2	22	....	15 67	....	....	....
	2	22	818 86	....	....	8 12	4	630 44	630 44	8 12	3	....	....	....	....	....	....	1 02	....	....	....
	3	45	1229 44	17 30	1	....	....	700 43	715 19	....	2	....	....	....	....	....	....	1 13	....	....	....
	4	116	3865 25	325 42	7	....	11	2168 52	2004 96	163 56	8	....	....	....	....	....	....	3 86	....	....	....
	5	84	2780 92	66 00	5	37 55	5	1077 28	1077 28	37 55	3	....	....	....	....	....	....	2 58	....	....	....
	6	140	5794 25	357 96	9	....	21	1063 34	1641 02	22 32	13	1	....	....	2	19 00	1	6 13	....	....	....
	7	124	2699 82	492 28	13	40 31	22	1694 79	1683 50	51 60	6	....	....	....	....	....	....	2 52	....	....	....
	8	40	928 65	281 62	6	....	14	394 01	379 01	15 00	....	2	....	....	....	....	....	1 08	....	....	....
	9	201	9284 38	938 67	26	57 41	38	2742 71	2660 56	82 15	13	....	....	....	....	....	....	6 97	....	2	10 00
	10	104	2452 64	88 12	3	81 20	1	977 66	1022 36	36 50	4	....	....	....	....	....	....	2 32	....	....	....
	11	43	1205 07	308 25	4	12 17	19	231 87	214 63	17 24	3	....	....	....	....	....	....	1 32	....	....	....
	12	125	4650 15	528 79	10	....	2	2577 03	2547 78	29 25	7	2	1	....	....	....	....	4 15	....	1	10 00
Huron....	1	247	8157 30	763 54	18	237 79	81	1697 96	1821 41	114 34	16	....	....	....	..	....	....	7 69	....	....	....
	2	214	6056 67	281 42	9	1 25	21	3343 52	3330 15	14 62	13	1	1	....	1	12	....	5 74	....	1	5 00
	3	141	6078 15	840 00	18	....	25	1662 19	1682 19	....	15	1	....	....	1	9	....	6 21	....	2	9 00
	4	78	3048 81	559 28	11	1 00	14	921 01	921 81	....	4	....	....	....	....	....	....	2 87	....	3	18 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the Goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 16 of "The Division Courts Act," 1880.	The amount of costs so taxed.	
Brought forward	86	14015	532086	09	1161	57197	33	2671	6968	29	185860	18	185389	20	14643	29	1011	70	22	44	450	50	4	526	73	1481	34	91	559	00
Hastings..	12	1180	50611	43	112	5458	58	168	332	55	20558	65	19886	70	13660	89	867	96	63	5	18	3	38	4	388	50	41	00	3	1	455	47	48	75	1481	34	82	3	507	00	20	00
Huron.....	....	680	23340	93	56	2444	24	141	240	04	7624	68	7735	56	128	96	48	2	1	2	21	00	....	22	51	.....		6	32	60												
Carried forward	86	14015	532086	09	1161	57197	33	2671	6968	29	185860	18	185389	20	14643	29	1011	70	22	44	450	50	4	526	73	1481	34	91	559	00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Act," 1880.	The amount of costs so taxed.
				$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
	Huron.—*Continued*	5	83	4129 23	9	634 54	4	6 62	2295 29	2260 25	41 66	13						1 81			
		6	32	1324 20	6	142 85	1		332 40	330 14	2 66	2						1 19			
		7	262	1789 02	4	706 73	4		1077 16	1077 16					3	36 00		1 53			5 00
		8	100	3565 25	16	641 85	10	19 06	1763 49	1749 50	13 99	5			2	23 00		3 35		1	10 00
		9	67	2745 56	17	478 90	1	41 73	983 04	968 79	55 98	6						2 73			
		10	40	1411 44	5	42 71	1		255 70	249 70	6 00	2						1 31			
		11	53	1898 38	4	647 95		35 92	749 65	778 66	6 91	5						1 91			
		12	53	1798 83	9	348 20	6		923 73	923 73		2			1	12 00		1 46			
	Kent.....	1	528	26338 93	32	1497 05	104	612 54	9211 16	9672 12	151 58	64	2					27 82	66 00	3	22 00
		2	237	9195 91	16	764 16	76	67 22	4522 78	4528 40	61 60	19	1					9 04			
		3	262	9288 37	16	702 66	30	44 12	4387 64	4422 76	9 00	18						9 00			
		4	200	6867 28	15	580 94	32	49 71	2187 33	2316 22	140 81	11						7 40			
		5	256	10605 22	46	1678 45	25	185 96	4879 07	4669 20	209 87	22				11 00		10 48		2	20 00
		6	129	5391 10	25	1071 88	40	35 66	2494 46	2530 62		15	2		1			5 85			
		7	145	5745 00	29	1694 55	24	781 73	2251 38	2218 67	814 44	8	1		1	11 00		4 45			

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Act," 1880.	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.										
Brought forward.	86	14015	532086 09	1161	57197 33	2671	6968 29	185860 18	185389 20	14643 29	1011	70	22	44	450 50	4	526 73	1481 34	91	559 00
Huron.—*Continued*	12	473	18656 91	70	3643 73	27	103 33	8380 46	8337 93	126 80	35	.....	.....	6	71 00	.....	18 29	.....	2	15 00
Kent. ...	7	1787	73431 81	180	7989 69	331	1776 94	30233 82	30437 99	1387 31	157	6	3	2	22 00	.....	74 04	66 00	5	42 00
Carried forward.	105	16275	624174 81	1411	68830 75	3029	8848 56	224474 46	224165 12	16157 40	1263	76	25	52	543 50	4	619 06	1547 34	98	616 00

RETURN of Division Court Business,—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgment Summonses from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 16 of "The Division Courts Act," 1880.	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.		$	c.		$	c.
Lambton.	1	1	290	10936	33	16	355	51	25	47	36	2753	10	2746	41	64	05	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2	2	138	3216	59	10	229	43	12	221	48	1942	75	1870	92	71	83	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	3	3	112	4132	37	41	1665	31	13	18	18	2945	12	2940	47	32	83	9	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	4	4	126	3761	27	27	463	21	3	...	...	1395	53	1395	53	...	...	6	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	5	5	87	2304	36	4	146	51	8	...	...	1727	31	1727	31	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	6	6	28	798	51	4	105	95	8	73	47	844	29	872	42	45	34	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	7	7	81	3170	75	11	299	45	...	191	14	1093	86	1220	90	64	10	6	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	8	8	442	15100	70	28	1108	55	127	190	76	6696	62	6590	89	105	73	23	...	...	...	1	10	00	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	9	9	122	2953	75	13	647	02	11	4	00	1685	01	1667	82	17	19	8	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lanark...	1	1	210	6909	38	5	229	52	45	91	96	1779	28	1793	32	80	92	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	29	...	...	...	1	10	00
	2	2	57	1151	68	8	202	84	9	109	55	702	02	766	26	50	31	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	16	...	...	...	...	...	...
	3	3	265	6963	97	8	449	07	86	4	50	2288	87	2292	37	1	00	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	51	...	...	...	1	5	00
	4	4	365	9158	50	15	770	89	74	...	...	3864	29	3832	11	22	18	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	82	...	...	...	5	19	00
	5	5	25	601	67	2	95	72	1	20	00	3	57	288	72	36	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	42	...	...	...	1	5	00
	6	6	125	4623	83	10	334	56	48	...	...	2336	73	2336	73	...	...	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	74	...	...	...	1	5	00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward .	105	16275	624174 81	1411	68830 75	3029	8848 56	224474 46	224165 12	16157 40	1203	76	25	52	543 50	4	619 06	1547 34	98	616 00
Lambton....	9	1426	46374 63	154	5014 03	307	746 39	21083 59	21082 67	401 07	82	9	3	2	22 00	2	43 86	11 08	9	69 00
Lanark....	6	1027	29429 03	48	2192 10	263	229 01	11266 76	11309 51	191 26	43	1	....	....	....	....	24 94	.....	9	44 00
Carried forward .	120	18728	699978 47	1613	76036 88	3599	9823 96	256824 81	256507 30	16749 73	1328	86	28	54	565 50	6	687 86	1558 42	116	729 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Leeds & Grenville	1	578	15997 64	13	652 27	132	329 63	7912 08	7460 19	781 52	15						12 48			10 00
	2	166	5635 92	8	210 45	20	107 23	2054 71	1991 53	167 41	14						5 84			5 00
	3	281	11099 90	12	668 55	48	95 28	2891 56	2671 92	219 92	20	3					10 73	26 10	2	16 00
	4	153	4975 74	5	228 02	21	140 57	1188 30	1199 59	129 38	6	5					4 08		1	
	5	185	4741 92	6	210 25	5		1768 91	1685 59	83 32	11						4 43		3	13 00
	6	111	4131 98	5	277 44	12		1766 36	1606 02	160 34	9						4 20		1	16 00
	7	78	1967 84	3	200 34	7	13 15	1693 93	1012 86	94 22		2					1 32			
	8	169	6526 10	13	467 67	17		2203 28	2203 28		13	4	1	1			6 55		2	16 00
	9	91	2795 15	2	20 02	6	4 00	922 72	913 72	13 00		1					2 50			
	10	40	1202 60	6	343 08	3	32 31	560 20	499 54	93 00	1						2 97			
	11	65	2113 77	2	85 05	8	11 00	621 47	613 47	11 00	5						2 24			
	12	51	2074 87			3		575 76	561 46	14 30	5		1				2 18		1	7 00
Lennox & Addington.	1	139	4006 86	10	349 24	36	55 74	1089 57	1071 77	73 94	8	2				1	4 34		2	12 00
	2	16	656 93	3	74 68	4	65 85	388 33	431 28	23 00		1		1	12 00		48			
	3	18	587 97	7	167 75	1		169 65	169 65				1				27			
	4	94	3555 25	2	85 17	32	118 92	638 12	700 84	56 20	9	2					3 91			
	5	62	2003 77	3	144 31	5	69 80	1012 01	1027 19	54 62	4	1					2 14			
	6	42	758 76	2	32 70	2		424 22	410 77	13 45	1						61			
	7	96	2986 66	5	467 38	8	82 17	1432 23	1508 90	5 50	5	1		1	6 00		26			

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties, or District.	Number of Divisions.	Number of Suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $160.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	Amount of costs so taxed.
Brought forward.	120	18728	699378 47	1613	76036 88	3599	9823 96	256824 81	256507 30	16749 73	1328	86	28	54	565 50	6	687 86	1558 42	116	729 00
Leeds & Grenville	12	1968	63263 43	75	3393 14	285	733 20	25562 28	22422 17	1767 31	103	11	2	....	.....	....	57 52	26 10	13	77 00
Lennox & Addington.	7	467	14556 20	32	1321 23	88	392 58	5154 53	5320 40	226 71	27	8	1	2	18 00	....	12 01	.....	2	12 00
Carried forward	139	21163	777798 10	1720	80751 25	3972	10949 74	285541 62	284249 87	18743 75	1458	105	31	56	583 50	6	757 39	1584 52	131	818 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of Claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.	$	c.		$	c.
Lincoln ..	1		84																											
	2		501	19294	24	21	822	60	78	751	28	1040	84	984	89	55	95					1	44							
	3		129	4503	67	16	768	54	19	14	71	1447	89	1426	60	36	00	10	1			18	85							
	4		111	3588	28	17	604	80	18			1590	77	1473	66	117	11	9				4	63							
	5		136	5275	89	33	1517	82	27	161	03	2713	27	2339	17	374	10	6	1		2	3	75							
	6		155	5670	93	10	416	46	32	134	43	1965	04	1729	50	369	97	10	4		2	22	00							
	7		118	2862	32	7	305	28	35			1263	98	1120	87	143	11	3	1		1	4	37	00						
	8		31	1052	54	2	142	60				420	54	467	19	5	00	2	1		1	4	26	00						
	9		189	3633	64	7	349	62	22	2	85	1738	02	1738	02			5	1		1	3	11	00						
Manitoulin.	1		78	2193	33	8	461	20	4			466	95	437	05	29	90	4	12											
	2		70	2831	11	8	378	80	2			1574	30	1535	27	39	03	5												
	3		34	1882	37	5	329	96				610	80	655	05	20	00	3	1											
	4		56	2005	20	10	698	94				833	99	829	39	4	60	1												
	5		136	5275	89	33	1517	82	27	161	03	2713	27	2339	17	374	10	6	1		2	2	22	00			4	56	2	15	00
	6		155	5670	93	10	416	46	32	134	43	1965	04	1729	50	369	97	10	4		2	1	12	00			5	14	4	22	00
	7		118	2862	32	7	305	28	35			1263	98	1120	87	143	11	3	1			4	37	00			2	22	1	10	00
	8		31	1052	54	2	142	60				420	54	467	19	5	00	2	1			3	26	00			1	04			
	9		189	3633	64	7	349	62	22	2	85	1738	02	1738	02			5	1			1	11	00			2	60	1	10	00
Middlesex	1		1556	58147	84	42	2719	19	111	1575	79	19063	13	18808	70	1830	22	94	5		3	12	132	00			54	14	16	96	00
	2		120	4610	21	11	878	29	13	97	62	1562	13	1514	94	144	81	9									4	20	1	5	00
	3		83	4042	94	8	361	37	6			1213	65	1112	99	100	66	10									4	33			
	4		56	2005	20	10	698	94				833	99	829	39	4	60	1									1	48			
	5		136	5275	89	33	1517	82	27	161	03	2713	27	2339	17	374	10	6	1		2	2	22	00			4	56	2	15	00
	6		155	5670	93	10	416	46	32	134	43	1965	04	1729	50	369	97	10	4		2	1	12	00			5	14	4	22	00
	7		118	2862	32	7	305	28	35			1263	98	1120	87	143	11	3	1			4	37	00			2	22	1	10	00
	8		31	1052	54	2	142	60				420	54	467	19	5	00	2	1			3	26	00			1	04			
	9		189	3633	64	7	349	62	22	2	85	1738	02	1738	02			5	1			1	11	00			2	60	1	10	00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.SO."	The amount of costs so taxed.	
Brought forward.	139	21163	777198	10	1720	80751	25	3972	10949	74	285541	62	284249	87	18743	75	1458	105		31	56	583	50	6	757	39	1584	52	131	818	00
Lincoln ..	4	825	29716	08	59	2408	33	126	804	36	9678	38	9343	56	1100	81	56	4		4					28	67			5	31	00
Manitoulin.	3	182	6906	81	21	1169	96	6	64	25	2652	05	2627	37	88	93	12	13		5	25	264	00		2	75			1	5	00
Middlesex	9	2444	87301	51	130	7349	57	246	2023	37	30773	75	29665	77	2972	47	140	13		5	25	264	00		79	71	637	17	25	158	00
Carried forward.	155	24614	901722	50	1930	91679	11	4350	13841	72	328645	80	325881	57	22905	96	1666	135		40	81	847	50	6	868	52	2221	69	162	1012	00

RETURN of Division Court Business.—*Continued*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of suits entered, where the amount claimed exceeds $100.	Number of actions for Tort where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.		$	c.		
Muskoka.	1	209	54	9642	62	23	962	10	11	.....	.....	2406	55	2406	55	123	91	9	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	5 00
	2	150	303	6164	53	31	1742	37	23	405	28	1389	96	1404	93	360	31	4	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	12 00
	3	112	221	4101	64	14	648	85	11	445	55	1180	01	1087	36	92	65	36	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	4	25	350	737	39	4	620	61	1	10	85	304	03	280	63	23	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nipissing.	1	—	54	2250	27	4	409	40	5	62	68	560	32	623	00	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	2	303	221	13707	15	8	516	38	13	.....	.....	3250	03	3259	03	.....	.....	21	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	3	221	350	6883	03	14	671	92	14	76	98	2193	57	2140	25	50	32	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	4	350	.....	12553	98	21	935	66	75	401	45	497	87	4426	85	172	47	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk.	1	195	54	6644	71	10	532	36	42	77	60	2620	38	2624	01	123	91	9	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	2	90	303	2033	66	12	402	55	35	38	88	372	49	274	86	97	63	9	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	3	64	221	1960	05	4	91	07	10	75	21	634	19	611	61	97	76	21	2	.....	.....	3	33	00	.....	.....	.....	1	55	.....	.....
	4	131	350	4029	77	37	1682	54	36	125	60	1702	20	1651	19	173	61	2	2	.....	.....	1	12	00	.....	.....	.....	.....	72	.....	.....
	5	109	.....	2468	36	10	602	46	42	.....	.....	1790	13	.....	.....	.....	.....	7	.....	.....	.....	3	22	00	.....	.....	.....	.....	73	1	7 50
	6	147	350	3040	00	41	700	00	33	298	49	1325	64	1403	63	15	00	3	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	91	2	10 00
	7	31	.....	862	61	19	489	55	5	18	86	535	92	507	19	28	73	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58	.....	.....
	8	43	.....	1157	49	1	17	54	3	.....	.....	269	72	269	72	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	.....	.....

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney, or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
Brought forward.	155	24614	901722 50	1930	91679 11	4350	13841 72	328645 80	325881 57	22905 96	1666	135	40	81	847 50	6	868 52	2221 69	162	1012 00
Muskoka.	4	496	20646 18	77	3973 96	46	861 68	5250 55	5179 47	476 36	21	36	2	....	.....	....	.....	.....	3	17 00
Nipissing.	4	928	35394 43	47	2533 36	107	547 11	10201 79	10440 13	222 79	49	....	1	....	.....	....	.....	9 10	2	4 00
Norfolk ..	8	810	22197 55	134	4518 07	206	631 61	9250 67	9135 40	536 67	34	15	1	9	91 00	....	23 46	.....	3	17 50
Carried forward.	171	26848	979960 66	2186	102704 50	4709	15885 15	353348 81	350636 57	24141 78	1770	186	44	90	938 50	6	891 98	2230 79	170	1050 50

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgment Summonses from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R S.O."	The amount of costs so taxed.	
					c.			c.			c.			c.			c.								c.					c.
				$			$			$		$		$		$							$		$			$	
Northumberland & Durham..		1	198	8665	91	8	315	16	26	124	58	2363	32	2408	24	79	66	16	1	.....	.....	3	1	12	00	.....	.....	5	00
		2	102	4295	29	7	626	26	8	100	07	610	77	548	36	62	41	7	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....
		3	204	8826	78	20	726	75	43	230	22	1941	90	2011	72	160	40	17	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
		4	165	7338	27	22	1190	11	45	51	82	2068	32	1998	32	70	00	19	.....	3	.....	2	.....	.....	.....	1	10	00	.....	.....
		5	210	9005	74	9	554	62	54	187	07	2065	24	2117	68	134	63	24	.....	1	.....	1	.....	.....	.....	1	25	00	4	00
		6	52	1623	09	8	374	74	4	14	00	985	97	981	85	18	12	1	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	1	00
		7–8	147	6300	83	8	412	52	26	18	60	2342	58	2325	13	17	40	15	.....	3	.....	1	.....	.....	.....	.....	.....	.....	5	40	00
		9	117	6785	41	14	526	55	46	.....	.....	631	20	631	20	.....	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	25	00
		10	122	3255	48	8	522	46	23	277	21	1334	43	1495	20	207	37	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		11	69	1943	87	16	721	94	18	.....	.....	1514	88	1498	88	15	00	3	.....	.....	1	6	47	00	.....	.....	1	5	00	.....	.....
		12	135	5107	25	11	715	51	12	348	29	1277	56	1345	54	260	36	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	00	.....	.....
Ontario..		1	246	105	94	12	820	70	15	.....	.....	2257	27	2257	47	.....	.....	18	3	2	1	1	12	00	.....	.....	4	20	00	.....	.....
		2	136	5161	07	14	921	27	24	24	00	2238	73	2262	73	.....	.....	11	2	1	.....	.....	.....	.....	.....	.....	2	9	00	.....	.....
		3	182	8117	77	15	435	24	18	59	65	2230	79	2229	58	1	21	13	1	.....	.....	.....	.....	.....	.....	.....	3	25	00	.....	.....
		4	273	10227	77	33	1687	26	98	177	00	3187	31	3339	31	25	00	1	.....	.....	.....	.....	.....	.....	.....	.....	1	5	00	.....	.....
		5	163	6690	28	17	1449	25	13	.....	.....	4387	21	4111	34	.....	.....	8	1	.....	1	.....	12	00	.....	.....	.....	5	68	.....	.....
		6	79	2537	84	5	295	34	1	84	00	823	14	871	83	35	31	3	1	.....	1	.....	12	00	.....	.....	2	49	.....	2	14	00
		7	37	1424	35	5	167	27	11	.....	.....	340	39	326	85	13	54	.....	3	.....	1	1	12	00	.....	.....	84	.....	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $10.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $10.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney, or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Carried forward.	171	26848	979960 66	2186	102704 50	4709	15885 15	353348 81	356636 57	24141 78	1770	186	44	90	938 50	6	891 98	2230 79	170	1050 50
Northumberland & Durham...	11	1521	63147 92	131	6686 62	305	1351 86	17136 17	17273 12	1025 35	133	8	2	17	168 50	2	54 18	.....	17	120 00
Ontario...	7	1116	34265 02	101	5776 33	180	344 65	15464 84	15339 11	75 06	54	10	5	4	48 00	....	42 05	... .	12	73 00
Carried forward.	189	29485	1077373 60	2418	115167 45	5194	17581 66	386949 82	388308 80	25242 19	1957	204	51	111	1155 00	8	988 21	2230 79	199	1243 50

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agent's Fees under Section 203 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.		$	c.		$	c.
Oxford....	1	884	32993	55	41	2306	05	183	1949	69	13869	21	1681	15	1917	16	82	1	.....	.....	8	57	00	5	35	59	2	10	00
	2	91	3903	72	18	1083	24	8	34	53	1718	29	608	48	78	36	7	1	.....	.....	.....	.....	.....	.....	3	61	.....	.....	.....	.....	.....
	3	75	2717	60	10	306	40	14	30	93	1924	76	629	75	48	08	6	1	.....	.....	1	11	00	.....	2	64	.....	.....	.....	.....	.....
	4	201	7138	00	15	688	90	30	.....	.....	3025	48	1602	08	2926	13	14	.....	.....	.....	1	12	00	.....	7	23	1	3	00	.....	.....
	5	465	15033	10	22	1081	15	38	268	99	7290	17	1335	88	7014	13	20	.....	.....	.....	3	33	00	.....	14	00	3	12	00	.....	.....
	6	217	6873	17	18	750	67	95	60	16	2733	44	.....	.....	2696	87	10	.....	.....	.....	.....	.....	.....	.....	6	88	1	5	00	.....	.....
Parry Sound..	1	98	3708	23	15	854	52	18	40	41	1681	15	1619	31	61	84	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	50	.....	.....
	2	92	4075	22	15	672	41	8	.....	.....	1071	87	1043	87	28	00	6	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	3	15	.....	58	88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	4	122	3946	91	25	1950	56	11	8	40	1916	96	1852	48	72	88	4	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	5	53	1794	84	5	275	94	11	60	96	608	48	603	48	65	96	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	6	69	1910	41	16	1262	13	8	46	04	1629	75	1602	08	74	71	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	7	80	2926	74	14	786	93	5	.....	.....	1335	88	1335	88	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peel..	1	298	22233	90	20	974	77	99	312	32	4191	72	4380	79	123	25	42	.....	2	2	19	00	.....	.....	15	66	.....	.....	11	75	00
	2	91	3473	15	33	2625	57	15	30	00	1171	15	1180	18	21	05	6	.....	.....	.....	.....	.....	.....	.....	3	42	.....	.....	.....	.....	.....
	3	87	3497	26	13	590	39	10	60	00	876	95	919	67	17	28	10	.....	.....	.....	.....	.....	.....	.....	3	94	.....	.....	.....	.....	.....
	4	90	4390	81	9	250	64	6	7	73	1801	25	1724	27	76	98	20	.....	.....	.....	.....	.....	.....	.....	6	61	.....	.....	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward.	189	2485	107373 60	2418	115167 45	5194	17581 66	386919 82	383308 80	25242 19	1957	204	51	111	1155 00	8	988 21	2230 79	199	1243 50
Oxford....	6	1933	68659 14	124	6216 41	368	2344 30	30561 35	30120 94	2515 72	139	3	.....	13	113 00	7	69 15	280 26	7	30 00
Parry Sound..	7	529	18362 35	92	5861 47	61	155 81	8244 09	8057 10	303 39	22	1	1	2	19 00	.....	29 63	.....	1	2 50
Peel.....	4	566	33599 12	75	4441 37	130	410 05	8041 07	8204 83	238 56	78	.....	2	2	19 00	....	29 63	.....	11	75 00
Carried forward.	206	32513	119994 21	2709	131686 70	5753	20491 82	433796 33	430691 67	28299 86	2196	208	54	126	1287 00	15	1086 99	2511 05	218	1351 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.		$	c.	
Perth	1	1	338	11315	08	25	1037	02	33	187	38	3738	27	3911	45	14	20	29	3	1						12	59			
	2	2	102	4415	42	7	264	83	21	21	73	1423	69	1391	29	55	13	7								4	09			
	3	3	169	5085	01	10	387	44	22	.....		2446	65	2446	65	.....		14	...	...						5	12			
	4	4	49	1647	31	2	45	52	3	29	77	692	82	648	40	44	42	1	...	...						1	09			
	5	5	61	2413	39	3	272	48	3	.....		1111	45	1088	59	22	86	1	2	...						2	02			
	6	6	176	5857	62	23	1317	68	26	80	48	2462	11	2437	68	94	91	12	3	...						5	64			
Peterboro'	1	1	706	25858	01	31	2035	37	67	.....		6471	24	6471	24	.....		54	4	...	4	41				25	44			
	2	2	130	4811	21	19	1428	62	11	104	92	2486	87	2465	15	126	64	11	1	...						5	00			
	3	3	12	308	46	1	206	27	...	22	02	97	79	112	69	7	12	...	...	...						21	...			
	4	4	75	2813	27	4	176	52	8	34	94	1243	55	1278	49	.....		6	2	...	3	35				2	91			
	5	5	8	226	29	6	281	60	1	6	00	57	60	62	60	.....		...	...	...	...	.....				15	...			
																										81	57	3	15	
																										.....		.....	.....	
																										.....		.....	.....	
																										.....		1	5	
																										.....		.....	.....	

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward.	206	32513	1197994 21	2709	131686 70	5753	20491 82	433796 33	430691 67	28299 86	2196	208	54	126	1287 00	15	1086 99	2511 05	218	1351 00
Perth	6	895	30733 83	70	3324 97	108	319 36	11865 99	11924 06	231 52	64	5	.....	.....	.....	....	30 55	.....	6	30 00
	5	931	34017 24	61	4128 38	87	167 88	10357 05	10390 17	133 76	71	7	2	7	76 ...	...	33 71	81 57	4	20 00
Carried forward	217	34339	1262745 28	2840	139140 05	5948	20979 06	456019 37	453005 90	28665 14	2331	220	56	133	1363 00	15	1151 25	2592 62	228	1401 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
				$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Prescott and Russell	1	1	58	2275 83	7	206 20	9		656 94	655 44	1 50	5			5	69 00	1	2 34		1	10 00
	2	2	39	2378 75	2	138 10	5		1563 34	1563 34		8				12 00		2 37			
	3	3	38	1441 27			2		496 87	496 87		2		1	1	12 00		1 25			
	4	4	88	3935 85	6	348 79	5	88 73	1251 99	1251 04	89 68	8	1					3 98			
	5	5	94	4191 79	2	90 83	7	15 90	1387 13	1283 07	104 29	7						3 73		1	5 00
	6	6	34	1705 40	8	226 79	5	121 65	804 63	869 83	55 85	5						1 82		1	5 00
	7	7	54	1454 72	4	321 41	27	71 67	840 17	874 84	37 00	2						1 25			
	8	8	53	2119 12	1	56 40	8	88 78	948 99	904 43	133 35	4						1 96			
	9	9	103	3597 12	2	59 30	21	6 46	1002 11			6		1				3 39		3	15 00
	10	10	84	3340 43	2	65 28	2		1462 82	1419 08	43 74	5						1 07			
	11	11	91	3580 32	14	910 49	8	7 60	1477 51	1436 44	21 07	5						3 08		2	10 00
Prince Edward.	1	1	174	4813 80	12	606 65	33		1527 39	1427 48	99 91	9			5	69 00	1	4 12			
	2	2	55	1791 77	3	142 42	1	7 00	563 67	565 67	5 00	2			4	47 00		1 43			
	3	3	27	1106 78	2	180 05			276 51	276 51		2						1 10			
	4	4	27	1357 23	2	196 18	1		649 05	649 05		4						1 18		1	8 00
	5	5	36	1066 99	1	105 95	7		188 43	128 43	60 00	3		1				1 20			
	6	6	33	1168 62			8		85 95	32 82	43 13	3			3	31 00		1 32		2	12 00
	7	7	30	1541 73	4	305 01	1		43 34	43 34		4						1 66			
	8	7	7	236 40	9	171 52	4		15 00	15 00								24			

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward.	217	34339	1262745 28	2840	139140 05	5948	20979 06	456019 37	453005 90	28665 14	2331	220	56	133	1363 00	15	1151 25	2592 62	228	1401 00
Prescott and Russell	11	736	30020 60	48	2423 59	99	400 19	11892 50	11776 49	486 48	57	1	2	2	24 00	....	29 24	.....	8	45 00
Prince Edward.	8	389	18103 32	28	1707 18	58	7 00	3349 34	3138 30	208 04	27	....	1	12	147 00	1	12 25	.....	3	20 00
Carried forward	236	35464	1305869 20	2916	143270 82	6105	21386 25	471261 21	467920 69	29359 66	2415	221	59	147	1534 00	16	1192 74	2592 62	239	1466 00

RETURN of Division Court Business.—*Continued*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Rainy River ..	1	175	7977 49	2	241 79	8	61 53	2268 83	2232 78	36 05	17	2				1				
	2	6	178 91	1	44 85	....	.....	.....	.....	.....	.....	.....				....	.....	.....	....	.....
Renfrew .	1	381	13449 65	18	810 10	63	94 12	5010 00	4944 94	182 18	26	2		1	10 00		19 90	24 62	3	25 00
	2	37	1252 50	1	111 33	....	8 54	605 69	581 69	32 54	1	.....	.....	.....	.....	.....	6 35	.....	.....	.....
	3	237	8521 43	6	166 25	22	56 94	4107 39	4147 22	17 11	13	.....	.....	.....	.....	.....	11 91	.....	.....	.....
	4	153	7309 93	14	813 55	9	50 71	2536 85	2507 89	28 96	24	.....	.....	.....	.....	.....	10 67	.....	.....	.....
	5	32	1579 94	3	134 02	3	.....	636 80	636 80	.....	6	.....	.....	.....	.....	.....	5 13	.....	.....	5 00
	6	75	2841 28	4	237 80	8	10 69	1012 73	951 69	71 82	4	1	.....	.....	.....	.....	17 88	1 37	8	42 00
	7	38	1238 89	3	175 73	2	50 14	584 83	580 25	4 58	2	.....	.....	.....	.....	.....	2 72	.....	.....	.....
	8	43	1259 05	1	49 55	....	.....	869 20	869 20	.....	1	.....	.....	.....	.....	.....	7 26	.....	.....	.....
Simcoe ...	1	405	16521 85	30	1299 91	82	3 00	6304 65	6247 01	57 61	40	2	.....	1	53 50	.....	8 99	.....	2	10 00
	2	126	4660 92	5	664 43	8	156 18	1042 18	912 83	129 35	16	.....	.....	.....	.....	.....	1 96	.....	.....	.....
	3	221	7948 40	21	1867 84	23	.....	4069 66	3967 35	.....	24	3	.....	.....	.....	.....	.....	.....	.....	.....
	4	268	11463 29	19	1266 01	39	1924 60	4487 68	4561 41	112 67	20	1	.....	4	12 00	.....	.....	.....	.....	.....
	5	125	5868 63	16	751 40	22	109 33	1830 55	1939 88	.....	12	2	.....	1	12 00	.....	.....	.....	.....	.....
	6	357	16252 89	47	2369 65	84	411 91	5522 82	5539 32	395 41	45	2	.....	2	22 00	.....	17 88	2 37	8	42 00
	7	83	2777 94	20	1341 53	5	599 91	2570 40	2097 62	472 78	5	1	.....	1	12 00	.....	.....	.....	.....	.....
	8	194	9457 20	23	1094 75	27	.....	1520 04	1471 28	48 76	15	1	.....	3	23 00	.....	2 72	.....	.....	.....
	9	245	10710 21	30	1472 79	58	230 31	3073 80	3051 26	22 54	23	6	.....	4	21 00	.....	7 26	.....	2	10 00
	10	91	2231 93	5	450 17	11	.....	864 90	833 40	31 50	1	.....	.....	.....	.....	.....	1 96	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The Name of County United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
Brought forward	236	35464	1305869 20	2916	143270 82	6105	21386 25	471261 21	467920 69	29359 66	2415	221	59	147	1534 00	16	1192 74	2592 62	239	1466 00
Rainy River ..	2	181	8156 43	3	289 64	8	64 53	2268 83	2232 78	36 05	17	2	2	1	.....	1	.....	2 19	6	.....
Renfrew .	8	996	37452 67	50	2498 33	107	335 67	15363 49	15219 59	337 19	77	4	.....	16	10 00	....	38 09	26 89	12	45 00
Simcoe ..	10	2115	90892 66	216	12478 48	359	3435 24	31226 68	30624 41	1270 62	201	18	1	16	155 50	....	92 77	.....	.....	62 00
Carried forward	256	38756	1442370 96	3185	158837 27	6579	25221 69	520120 21	515997 47	31063 52	2710	245	62	164	1699 50	17	1323 60	2621 70	257	1573 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $10.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.	$	c.		$	c.
Stormont, Dundas & Glengarry	1	1	126	4817	06	5	254	90	31	302	93	2873	53	2921	22	255	24	9													1	5	00
	2		227	8103	79	10	517	59	23	127	65	2641	49	2611	41	157	68	74													1	0	
	3		546	15447	75	14	572	41	145	203	86	6610	63	6303	43	307	20	44	4														
	4		138	4347	13	7	461	65	24	21	35	1602	41	1572	43	51	33	9		5													
	5		160	7412	96	11	352	18	11			2725	49	2725	49			22	2	1													
	6		197	2568	71	10	425	68	30	104	92	2152	23	2205	16	51	09	12	4														
	7		62	1640	10	3	235	56	6			1274	15	1274	15			2															
	8		123	3582	37	8	525	76	15	91	57	2122	95	2130	30	84	22	3			1	12	00									
	9		113	3340	80	5	150	06	6	20	62	1400	02	1372	11	27	91	8														
	10		158	5035	47	13	724	06	13			2309	68	2309	68			13															
	11		106	4255	40	5	148	60	18	32	41	1530	42	1530	42	22	59	8															
	12		81	3133	02	9	617	48	30			1783	94	1783	94	146	44	8															
Thunder Bay	1		156	8031	10	10	696	19	5	18	00	2103	73	2121	73			25													3	9	00
	2																																
	3		134	5776	49	1	16	79	5	88	25	1248	36	1260	61	76	00	15		1													

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
Brought forward.	256	38756	1442370 96	3185	158537 27	6579	25221 69	520130 21	515997 47	31003 52	2710	245	62	164	1699 50	17	1323 60	2621 70	257	1573 00
Stormont, Dundas & Glengarry	12	2037	63884 56	100	4985 93	352	905 31	29026 94	28739 74	1103 70	152	10	7	2	24 00	....	65 80	38 17	7	42 00
Thunder Bay ...	3	290	13807 59	11	712 98	10	106 25	3352 09	3382 34	76 00	40	....	1	....	.....	....	.....	.....	3	9 00
Carried forward.	271	41083	1520063 11	3296	164236 18	6941	26233 25	552499 24	548119 55	32183 22	2902	255	70	166	1723 50	17	1389 40	2659 87	267	1624 00

RETURN of Division Court Business.—*Continued.*

The Name of County United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
				$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.		$	c.		$	c.
Victoria .	1	147	5806	09	17	767	70	27	.....	.....	1171	15	1171	15	.....	.....	15	2	3	.....	.....	.....	2	5	44	.....	.....	.....	.....	.....	3	00
	2	122	5186	36	6	304	96	7	9	40	1126	72	1109	44	17	28	10	1	1	.....	.....	.....	4	5	44	.....	.....	.....	1	.....	.....	.....
	3	67	1792	71	5	269	05	7	33	55	496	17	456	35	73	37	1	.....	.....	.....	.....	.....	.....	1	30	.....	.....	.....	.....	.....	.....	.....
	4	74	2098	24	5	333	73	9	.....	.....	996	35	996	35	.....	.....	2	1	.....	.....	.....	.....	.....	1	73	.....	.....	.....	.....	.....	.....	.....
	5	352	16281	98	22	1160	78	40	174	69	5276	93	5283	77	167	85	41	.....	.....	.....	.....	.....	.....	17	03	1	81	.....	.....	8	45	00
	6	65	3077	58	6	453	37	6	27	68	1080	31	1107	99	.....	.....	8	1	.....	.....	.....	.....	.....	3	26	.....	.....	.....	.....	1	5	00
	7	151	3418	70	8	631	99	11	52	97	1203	34	1197	34	58	97	1	3	.....	.....	.....	.....	.....	2	14	.....	.....	.....	.....	.....	.....	.....
Waterloo .	1	369	14340	44	24	837	48	12	765	25	5286	24	5759	28	292	21	33	.....	.....	.....	.....	.....	.....	14	25	.....	.....	.....	.....	1	5	00
	2	97	3874	27	12	732	00	8	3	79	711	16	711	16	3	79	7	.....	.....	.....	.....	.....	.....	4	66	.....	.....	.....	.....	.....	.....	.....
	3	221	6518	92	23	1824	85	15	.....	.....	3058	19	3058	19	.....	.....	7	2	.....	.....	.....	.....	.....	6	31	.....	.....	.....	.....	1	5	00
	4	83	3151	20	10	576	31	2	62	84	1729	47	1729	13	63	18	12	.....	.....	.....	1	.....	.....	1	47	.....	.....	.....	.....	.....	.....	.....
	5	79	2818	67	4	226	37	4	8	50	1146	18	1031	60	123	08	3	.....	.....	.....	.....	.....	.....	2	43	.....	.....	.....	.....	.....	.....	.....
	6	47	1655	98	3	122	55	.....	.....	.....	1345	74	1345	74	.....	.....	3	.....	.....	2	.....	.....	.....	1	68	.....	.....	.....	.....	.....	.....	.....
	7	145	5679	65	2	95	99	2	.....	.....	3154	81	3154	81	.....	.....	9	.....	.....	1	.....	.....	.....	5	10	.....	.....	.....	.....	.....	.....	.....

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney, or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Brought forward.	271	41083	1520063 11	3296	164236 18	6941	26233 25	552499 24	548119 55	32183 22	2902	255	70	166	1723 50	17	1389 40	2659 87	267	1624 00
Victoria .	7	978	37661 66	69	3921 58	107	298 29	11350 97	11322 39	317 47	78	8	4			6	36 34	1 81	10	53 00
	278	42061	1557724 77	3365	168157 76	7048	26531 54	563850 21	559441 94	32500 69	2980	263	74	166	1723 50	23	1426 14	2661 68	277	1677 00
Waterloo.	7	1041	38039 13	78	4415 55	43	840 38	16431 79	16789 91	482 26	74	2	4				38 90		2	10 00
Carried forward.	285	43102	1595763 90	3443	172573 31	7091	27371 92	580282 00	576231 85	32982 95	3054	265	78	166	1723 50	23	1464 64	2661 68	279	1687 00

RETURN of Division Court Business.—*Continued*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of suits entered, where the amount claimed exceeds $100.	Number of actions for Tort where the amount claimed exceeds $10.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Jurors summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Welland..	1	218	9980 04	16	1519 48	49	.....	3976 75	3942 63	34 12	24	....	1	1	11	....	10 29	.....	3	20 00
	2	41	1021 62	16	1148 68	12	22 75	706 91	716 06	13 60	1	1	.....	.....	.....	.....	97	.....	.....	.....
	3	85	4266 59	5	65 96	6	123 24	2065 42	1998 24	137 18	9	.....	.....	.....	.....	.....	4 38	.....	.....	.....
	4	171	6545 55	22	242 30	21	53 39	2346 25	2600 97	98 67	14	.....	.....	4	33	.....	6 38	.....	1	10 00
	5	98	3518 71	14	565 33	14	60 00	647 82	566 67	141 15	6	.....	.....	.....	.....	.....	3 37	.....	.....	.....
	6	60	1689 40	1	54 50	11	32 70	732 32	732 32	32 70	10	.....	.....	.....	.....	.....	3 34	.....	1	8 00
Welling-ton.	1	405	14076 37	23	1012 41	57	392 73	3792 62	3844 19	341 16	25	1	.....	.....	.....	.....	12 76	.....	1	5 00
	2	44	1691 57	8	454 52	14	.....	1885 14	1885 14	.....	3	.....	.....	1	12	.....	1 62	.....	.....	.....
	3	19	510 34	1	80 37	1	3 00	257 91	257 91	3 ...	8	.....	.....	.....	.....	.....	39	.....	.....	.....
	4	144	4770 46	14	1008 09	32	.....	1428 52	1428 52	.....	.....	.....	.....	.....	.....	.....	4 70	.....	.....	.....
	5	85	889 20	18	1131 33	18	33 25	939 48	921 55	17 93	4	1	.....	1	12	.....	2 59	.....	1	5 00
	6	62	3095 63	6	237 51	6	134 81	1762 58	1897 39	.....	9	...	3	.....	.....	.....	3 54	.....	1	5 00
	7	103	4876 36	9	405 16	10	34 65	1621 64	1621 74	34 55	6	....	.....	.....	.....	.....	3 87	.....	.....	.....
	8	185	6651 06	22	1179 71	29	2 27	1938 58	1929 41	9 17	10	....	.....	.....	.....	.....	6 23	.....	.....	.....
	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	10	130	4914 75	24	1364 71	17	81 13	3034 33	2972 08	62 25	11	2	.....	.....	.....	.....	4 86	.....	3	20 00
	11	160	6926 29	13	889 57	22	241 41	2004 90	1943 75	302 56	16	....	.....	.....	.....	.....	7 06	.....	4	23 00

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgment and Judgment Summonses.		Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.		Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.		Total amount of Suitors' money paid into Court.		Total amount of Suitors' money paid out of Court.		Balance of Cash in Court.		Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.		Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."		The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 203 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.	
			$	c.		$	c.		$	c.	$	c.	$	c.	$	c.					$	c.		$	c.	$	c.			
Brought forward.	285	43102	1595763	90	3443	172573	31	7091	27371	92	580282	00	576231	85	32982	95	3054	265	78	166	1723	50		1464	64	2661	68	279	1687	00
	302	44112	1671187	84	3655	189942	94	7410	28587	25	609723	17	605420	42	34210	99	3210	270	82	174	1803	50	23	1541	04	2661	68	294	1783	60
Welland..	6	673	27021	91	74	3596	25	113	292	08	10775	47	10486	89	457	42	64	1	1	6	56	00	....	28	73	.....		5	38	00
Welling-ton.	11	1337	48402	03	138	7773	38	206	923	25	18665	70	18701	68	770	62	92	4	3	2	24	00	....	47	67	.....		10	58	00
Carried forward.	302	44112	1671187	84	3655	189942	94	7410	28587	25	609723	17	605420	42	34210	99	3210	270	82	174	1803	50	23	1541	04	2661	68	294	1783	60

RETURN of Division Court Business.—*Continued.*

The Name of County, United Counties, or District.		Number of Divisions.	Number of suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Juries, called in pursuance of Section 122 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agent's Fees under Section 208 of "The Division Courts Act, R.S.O."	The amount of costs so taxed.
				$ c.		$ c.		$ c.	$ c.	$ c.	$ c.					$ c.		$ c.	$ c.		$ c.
Went-worth.	1	1	594	26977 20	30	1557 43	64	338 78	8113 99	8033 51	419 26	60	2	1	2	7 00	....	28 72	66 00	5	26 00
	2	2	120	4430 14	4	257 01	13	45 44	1457 16	1469 19	33 41	11	....	....	1	5 00	....	5 08	....	....	....
	3	3	58	1323 75	6	362 27	5	.... 48 43	597 68	561 11	36 57	1	....	1	....	....	....	97	....	....	....
	4	4	69	2570 54	7	242 98	3	....	1437 77	1450 20	36 50	3	2	1	2	11 00	....	2 13	....	....	....
	5	5	26	767 33	....	....	....	....	517 24	517 24	....	1	....	....	....	....	....	77	....	....	....
	6	6	19	870 81	8	286 46	1	55 91	268 67	290 13	31 45	1	....	....	....	....	....	83	....	....	....
	7	7	14	400 28	1	86 42	3	....	322 92	314 92	8 00	....	....	....	1	11 00	1	24	99	....	....
	8	8	21	764 12	3	121 32	5	....	451 59	451 59	....	3	....	....	....	....	....	....	....	....	....
	9	9	574	26401 47	23	1067 86	13	998 92	7848 52	8088 61	758 63	67	5	....	1	10 00	....	28 09	88 20	2	10 00
York	1	1	2637	140784 05	57	3848 77	750	312 07	22193 97	20930 23	1263 00	327	9	3	2	21 00	....	138 43	1743 87	17	48 00
	2	2	202	8211 15	19	1192 95	60	155 77	2503 95	2546 24	113 48	17	....	....	....	....	....	8 57	....	....	....
	3	3	68	2754 26	7	126 41	11	109 53	1378 36	1438 67	49 22	8	1	....	....	....	....	3 14	....	....	....
	4	4	248	10820 65	13	745 22	64	679 18	4186 60	4789 37	76 41	26	5	1	1	12 00	....	11 78	....	....	5 00
	5	5	161	2878 96	21	1372 78	5	310 65	2259 58	2119 06	451 17	16	....	....	1	12 00	....	6 97	....	1	5 00
	6	6	166	8565 46	14	817 79	17	48 80	2981 14	2915 62	65 52	30	....	....	....	....	....	10 44	....	1	....
	7	7	97	3099 14	11	471 09	22	18 75	1600 14	1587 14	31 75	7	1	....	2	24 00	....	3 31	....	....	....
	8	8	258	11722 90	30	2086 69	50	85 50	3262 16	2801 77	460 39	33	1	1	2	23 00	....	13 11	....	1	10 00
	9	9	69	2957 44	2	142 15	17	53 25	987 87	1014 42	26 70	6	....	....	....	....	....	2 88	....	....	....
	10	10	3516	194638 26	90	5960 62	1029	1 08	24375 22	23776 83	598 39	512	....	....	3	70 00	....	204 17	2305 31	23	89 00

RETURN of Division Court Business.—*Continued.*

The name of County, United Counties, or District.	Number of Divisions.	Number of Suits entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Amount of claims entered, exclusive of Transcripts of Judgments and Judgment Summonses.	Number of Transcripts of Judgments received from other Courts.	Amount of claims received by Transcripts of Judgments from other Courts.	Number of Judgment Summonses issued.	Balance of Cash in Court from the previous year.	Total amount of Suitors' money paid into Court.	Total amount of Suitors' money paid out of Court.	Balance of Cash in Court.	Number of Suits entered, where the amount claimed exceeds $100.	Number of actions for Tort, where the amount claimed exceeds $40.	Number of actions of Replevin, where the value of the goods or other property or effects distrained, taken or detained, exceeds the sum of $40.	Number of Jury Trials by Juries summoned.	Amount paid to Jurors summoned.	Number of Jury Trials by Jurors, called in pursuance of Section 168 of "The Division Courts Act."	Amount payable to County Treasurer for "Division Court Jury Fund."	The amount of Fees and Emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' Fees under Section 208 of "The Division Courts Act, R.S.O."	Amount of costs so taxed.
Brought forward.	302	44112	1671187 84	3655	183942 94	7410	28587 25	609723 17	605420 42	34210 99	3210	270	82	174	1803 50	23	1541 04	2661 68	294	1783 00
Wentworth..	9	1495	64511 64	82	3981 75	137	1487 98	21015 54	21776 50	1326 82	147	9	3	7	44 00	1	67 82	154 20	7	36 00
York	10	7422	385932 27	264	16764 47	2025	1881 50	65728 99	63919 35	3136 03	982	17	8	15	162 00	....	402 80	4049 18	43	157 00
Carried forward.	321	53029	2121631 75	4001	204689 16	9572	31956 73	696407 70	690516 27	38673 84	4339	296	93	196	2009 50	24	2011 66	6865 06	344	1976 00

TABLE B.

List of Division Court Clerks, their Post Office Address, the County and Number of Division in which their Courts are situated, for the Province of Ontario, up to 31st December, 1892 inclusive.

County.	No. of Division.	Name of Clerk.	Post Office Address.
Algoma	1	E. Biggins	Sault St. Marie.
	2	Thomas Sullivan	Bruce Mines.
	3	Wm. L. Nichols	Thessalon.
	4	John Mackintosh	Webbwood.
	5	Wm. J. Smith	Richard's Landing.
Brant	1	Joseph Robinson	Brantford.
	2	John K. Finlayson	Paris.
	3	David Baptie	St. George.
	4	Hy. Cox	Burford.
	5	J. R. Malcolm	Scotland.
Bruce	1	Wm. Collins	Walkerton.
	2	H. B. O'Connor	Teeswater.
	3	Joseph Barker	Kincardine.
	4	N. McKechnie	Paisley.
	5	Robt. Munro	Port Elgin.
	6	Hugh Murray	Underwood.
	7	A. Neelands	Invermay.
	8	James Walmsley	Wiarton.
	9	Angus Martyn	Ripley.
	10	W. Moshier	Lion's Head.
Carleton	1	J. R. Armstrong	Ottawa.
	2	Wm. Henderson	Fallowfield.
	3	Henry W. McDougall	Carp.
	4	W. P. Taylor	Fitzroy Harbour.
	5	John Kerr	Kars.
	6	Daniel McLaurin	Metcalf.
	7	F. W. Harmer	Hintonburg.
Dufferin	1	Joseph Pattulo	Orangeville.
	2	Alexander McLachlan	Shelburne.
	3	Wm. Love	Stanton.
	4	James Henry	Mono Mills.
	5	R. E. Hamilton	Grand Valley.
Elgin	1	A. Love	Aylmer.
	2	Alex. McBride	St. Thomas.
	3	Alex. McBride	St. Thomas.
	4	A. N. C. Black	Dutton.
Essex	1	James A. Stewart	Sandwich.
	2	J, H. C. Leggatt	Amherstburg.
	3	E. Allworth	Kingsville.
	4	C. Bell	Oxley.
	5	George A. Morse	Leamington
	6	E. P. Bouteiller	Belle River.
	7	John McCrae	Windsor.
	8	John Milne	Essex Centre.
	9	Wm. A. McIntosh	Comber.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Frontenac	1	Wm. J. Robinson	Kingston.
	2	P. McKim	Kingston.
	3	C. Ruttan	Sydenham.
	4	A. Grant	Verona.
	5	John McGrath	Sunbury.
	6	Jesse Shibley	Sharbot Lake.
Grey	1	Benjamin Allen	Owen Sound.
	2	David Jackson, jr	Durham.
	3	Thomas Plunkett	Meaford.
	4	T. J. Rorke	Heathcote.
	5	J. W. Armstrong	Flesherton.
	6	John McDonald	Chatsworth.
	7	Duncan Campbell	Hanover.
	8	Richard Stevens	Markdale.
Haldimand	1	D. McGregor	Caledonia.
	2	David T. Rogers	Cayuga.
	3	T. Armour	Dunnville.
	4	R. A. Havill	Rainham.
	5	Elgin Birdsall	Canboro'.
	6	C. E. Bourne	Jarvis.
Haliburton	1	C. D. Curry	Minden.
	2	Wm. Prust	Haliburton.
	3	Stephen Kettle	Ursa.
Halton	1	Wm. Panton	Milton.
	2	R. Balmer	Oakville.
	3	Lachlan Grant	Georgetown.
	4	J. Matthews	Acton.
	5	Neil McPhail	Nassagaweya.
	6	James Robinson	Burlington.
Hastings	1	Harford Ashley	Belleville.
	2	Fras. B. Prior	Wallbridge.
	3	A. B. Randall	Shannonville.
	4	T. McCann	Tweed.
	5	F. B. Parker	Stirling.
	6	Arthur W. Coe	Madoc.
	7	A. S. Valleau	Deseronto.
	8	J. Sills	Canifton.
	9	James B. Young	Trenton.
	10	Marcus H. Powell	Marmora.
	11	James E. Harrison	Bridgewater.
	12	Dermott Kavanagh	Umfraville.
Huron	1	Charles Seager	Goderich.
	2	John Beattie	Seaforth.
	3	W. W. Farran	Clinton.
	4	A. Hunter	Brussels.
	5	T. Trivitt	Exeter.
	6	Jas. Whyard	Dungannon.
	7	John Morgan	Bayfield,
	8	James McGuire	Wingham.
	9	Joseph Cowan	Wroxeter.
	10	M. Zeller	Zurich.
	11	Wm. Lewis	Crediton.
	12	Wm. Campbell	Blyth.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Kent	1	W. B. Wells	Chatham.
	2	J. Duck	Ridgetown.
	3	S. Wallace	Dresden.
	4	Arch'd Samson	Blenheim.
	5	D. C. McDonald	Wallaceburg.
	6	George Moore	Bothwell.
	7	D. K. Farquharson	Fletcher.
Lambton	1	H. M. Poussett	Sarnia.
	2	Wm. McLeay	Watford.
	3	John Webster	Florence.
	4	William W. Stover	Sombra.
	5	T. R. K. Scott	Forest.
	6	Martin Wattson	Thedford.
	7	John McRae	Mooretown.
	8	W. G. Fraser	Petrolea.
	9	Richard Code	Alvinston.
Lanark	1	R. Jamieson	Perth.
	2	W. A. Field	Lanark.
	3	F. McEwen	Carleton Place.
	4	G. F. McKimm	Smith's Falls.
	5	Alex. Graham	Packenham.
	6	Wm. P. McEwen	Almonte.
Leeds and Grenville	1	D. B. Jones	Brockville.
	2	B. White	Prescott.
	3	S. McCannon	Gananoque.
	4	Oliver Bascom	Kemptville.
	5	E. H. Whitmarch	Merrickville.
	6	M. S. Denaut	Delta.
	7	Cyrus A. Wood	Toledo.
	8	L. S. Lewis	Newboro.'
	9	Isaac C. Alguire	Athens.
	10	G. Fairbairn	Spencerville.
	11	J. B. Bellamy	North Augusta.
	12	M. J. Connolly	Caintown.
Lennox and Addington	1	George D. Hawley	Napanee.
	2	Fred. W. Armstrong	Bath.
	3	Joseph B. Allison	Adolphustown.
	4	P. Johnstone	Camden East.
	5	W. Whelan	Centreville.
	6	J. A. Timmerman	Odessa.
	7	James Aylesworth	Tamworth.
Lincoln	1	James B. Secord	Niagara.
	2	W. A. Mittleberger	St. Catharines.
	3	Isaac Springstead	Abingdon.
	4	C. E. Riggins	Beamsville.
Manitoulin	1	Peter J. Anderson	Gore Bay.
	2	Herman Currie	Little Current.
	3	W. J. Tucker	Manitowaning.
Middlesex	1	Jno. W. McIntosh	London.
	2	William Dickson	Parkilll.
	3	Robt. J. McNamee	Lucan.
	4	W. C. Harris	Delaware.
	5	G. Wilson	Glencoe.
	6	Ed. Rowland	Strathroy.
	7	Ed. Thos. Shaw	Dorchester Station.
	8	Walter R. Westlake	Arva.
	9	E. S. Jarvis	London.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Muskoka	1	T. M. Bowerman	Bracebridge.
	2	W. R. Tudhope	Gravenhurst.
	3	J. R. Reece	Huntsville.
	4	R. G. Penson	Port Carling.
Nipissing	1	J. D. Cockburn	Sturgeon Falls.
	2	John McMeekin	Mattawa.
	3	John G. Cormack	North Bay.
	4	Thomas J. Ryan	Sudbury.
Norfolk	1	Charles E. Freeman	Simcoe.
	2	Ed. Matthews	Waterford.
	3	R. Green	Windham Centre.
	4	Jas. F. Cohoe	Ronson.
	5	M. J. McCall	Vittoria.
	6	S. P. Mabee	Port Rowan.
	7	D. C. Brady	Houghton.
	8	Lawrence Skey	Port Dover.
Northumberland and Durham	1	F. Cubitt	Bowmanville.
	2	S. Wilmott	Newcastle.
	3	G. M. Furby	Port Hope.
	4	Henry Elliott	Osaca.
	5	A. G. Boswell	Cobourg.
	6	H. Lawless	Grafton.
	7	S. S. Brintnell	Colborne.
	8	M. P. Ketchum	Brighton.
	9	R. P. Hurlburt	Warkworth.
	10	T. R. Garratt	Wooler.
	11	D. Kennedy	Campbellford.
Ontario	1	D. C. Macdonell	Whitby.
	2	M. Gleeson	Greenwood.
	3	J. W. Burnham	Port Perry.
	4	Jos. E. Gould	Uxbridge.
	5	Geo. Smith	Cannington.
	6	G. F. Bruce	Beaverton.
	7	F. J. Gillespie	Uptergrove.
Oxford	1	F. W. Macqueen	Woodstock.
	2	Chas. K. Currey	Drumbo.
	3	James Munro	Embro.
	4	Jas. Barr	Norwich.
	5	James Stevens	Ingersoll.
	6	John C. Ross	Tilsonburg.
Parry Sound	1	R. H. Stewart	Parry Sound.
	2	David Patterson	McKellar P. O.
	3	Wm. Ditchburn	Rosseau.
	4	Walter Sharpe	Burk's Falls.
	5	Saml. G. Best	Maganetawan.
	6	R. B. Maw	Commanda.
	7	James Dunn	Sundridge.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Peel	1	J. W. Main	Brampton.
	2	Thomas K. Beaty	Streetsville.
	3	John Harris	Caledon.
	4	David Pearcy	Bolton.
Perth	1	D. B. Burritt	Stratford.
	2	George K. Matheson	Mitchell.
	3	E. Long	St. Mary's.
	4	G. Brown	Shakespeare.
	5	Thomas Trow	Milverton.
	6	W. J. Hay	Listowel.
Peterborough	1	Francis James Bell	Peterborough.
	2	Thomas Fraser	Norwood.
	3	Jas. McNeil	Keene.
	4	W. Sherin	Lakefield.
	5	C. R. D. Booth	Apsley.
Prescott and Russell	1	David Buchan	L'Orignal.
	2	John Shields	Vankleek Hill.
	3	W. Allison	Stardale.
	4	Joseph Belanger	Plantagenet.
	5	J. S. Cameron	Cumberland.
	6	A. Carson	Russell.
	7	M. J. Costello	Hawkesbury.
	8	J. Downing	Fournier.
	9	F. W. Langrell	Alfred.
	10	Telesphore Rochon	Clarence Creek.
	11	Peter Stewart	Grant.
Prince Edward	1	Francis McManus	Picton.
	2	Henry Hullett Haight	Milford.
	3	Charles H. Wright	Demorestville.
	4	William C. Delong	Ameliasburg.
	5	John W. Clarke	Wellington.
	6	A. B. Saylor	Bloomfield.
	7	J. M Cadman	Consecon.
	8	B. E. Harrison	Waupoos.
Rainy River	1	P. H. Clark	Rat Portage.
	2	William Wilson	Fort Francis.
Renfrew	1	W. C. Irving	Pembroke.
	2	Hugh R. Dunn	Beachburg.
	3	George Eady, jr	Renfrew.
	4	George E. Neilson	Arnprior.
	5	John Gorman	Shamrock.
	6	James Reeves	Eganville.
	7	Robert Allan	Cobden.
	8	J. C. Gurney	Rockingham.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Simcoe	1	J. C. McNab	Barrie.
	2	Thomas S. Graham	Bradford.
	3	Geo. Chrystal	Beeton.
	4	R. G. Campbell	Collingwood.
	5	A. Craig	Craighurst.
	6	J. P. Henderson	Orillia.
	7	J. A. Mather	New Lowell.
	8	J. G. Hood	Alliston.
	9	Andrew McNamara	Penetanguishene.
	10	J. C. Steele	Coldwater.
Stormont, Dundas and Glengarry	1	G. H. McGillivray	Williamstown.
	2	Dougall B. McMillan	Alexandria.
	3	C. J. Mattice	Cornwall.
	4	Asaph Dawson	Dickinson's Landing.
	5	Wm. Garvey	Morrisburg.
	6	J. N. Tuttle	Iroquois
	7	W. J. Ridley	South Mountain.
	8	J. A. Cockburn	Crysler.
	9	Duncan C. McRae	North Lancaster.
	10	W. Rae	Chesterville.
	11	D. McIntosh	Strathmore.
	12	John D. McIntosh	Dominionville.
Thunder Bay	1	Neil McDougall	Port Arthur.
	2	John Aikins	English River.
	3	William McLean	Fort William.
Victoria	1	Peter McIntyre	Woodville.
	2	Edward D. Hand	Fenelon Falls.
	3	Irvine Junkin	Bobcaygeon.
	4	James D. Thornton	Omemee.
	5	O. J. McKibbin	Lindsay.
	6	J. F. Cummings	Oakwood.
	7	A. C. Graham	Victoria Road.
Waterloo	1	A. J. Peterson	Berlin.
	2	Jas. D. Webster	Preston.
	3	Thomas Field	Galt.
	4	J. Allchin	New Hamburg.
	5	Alfred Boomer	Linwood.
	6	J. L. Wideman	St. Jacob's.
	7	W. D. Watson	Ayr.
Welland	1	G. L. Hobson	Welland.
	2	Paul J. Wilson	Marshville.
	3	T. Newbigging	International Bridge.
	4	J. A. Orchard	Niagara Falls, South.
	5	T. F. Conlon, jr.	Thorold.
	6	A. K. Scholfield	Port Colborne.

List of Division Court Clerks, etc.—*Continued.*

County.	No. of Division.	Name of Clerk.	Post Office Address.
Wellington	1	Geo. Howard	Guelph.
	2	William Nicoll	Morriston.
	3	Hugh Black	Rockwood.
	4	T. W. Thomson	Fergus.
	5	W. Tyler	Erin.
	6	Henry Clarke	Elora.
	7	L. R. Adams	Drayton.
	8	Daniel Driscoll	Arthur.
	9	Joseph Patullo	Orangeville.
	10	John Livingston	Harriston.
	11	J. C. Wilkes	Mount Forest.
Wentworth	1	H. T. Bunbury	Hamilton.
	2	F. D. Suter	Dundas.
	3	Hugh Thompson	Waterdown.
	4	W. McDonald	Rockton.
	5	A. G. Jones	Stoney Creek.
	6	L. A. Gurnett	Ancaster.
	7	J. McClement	Glanford.
	8	Samuel C. Wright	Binbrook.
	9	R. L. Gunn	Hamilton.
York	1	A. McL. Howard	Toronto.
	2	J. Stephenson	Unionville.
	3	J. M. Lawrence	Richmond Hill.
	4	D. Lloyd	Newmarket.
	5	Warren P. Cole	Sutton West.
	6	A. Armstrong	King City.
	7	John Nattrass	Woodbridge.
	8	John Linton	Toronto Junction.
	9	J. H. Richardson	West Hill.
	10	E. H. Duggan	Toronto.

TABLE C.

List of Division Court Bailiffs, their Post Office Address, the County and Number of Division in which their Courts are situated, for the Province of Ontario, up to 31st December, 1892, inclusive.

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Algoma	1	Robert Rush	Sault Ste. Marie.
	2	John Knight	Bruce Mines.
	3	Jacob Stevenson	Thessalon.
	4	Wm. Irving	Webbwood.
	6	Daniel McPhail	Marksville, St. Jos. Is.
Brant	1	Joseph Jackson	Brantford.
	2	A. Huson	Paris.
	3	David B. Wood	St. George.
	4	Daniel Dunn	Burford.
	5	A. M. Malcolm	Scotland.
Bruce	1	M. Thompson	Walkerton.
	2	P. Corrigan	Holywood.
		John Farquharson	Teeswater.
	3	Alex. Campbell	Kincardine.
	4	W. W. Hogg	Paisley
	5	M. Hunter	Port Elgin.
	6	Gore Leggett	Underwood.
	7	Chas. A. Richards	Tara.
	8	H. Trout	Wiarton.
	9	John McRitchie	Ripley.
	10	Edward Barley	Lion's Head.
Carleton	1	E. A. Lapierre	Ottawa.
		John Whitton	Ottawa.
	2	W. H. Hamilton	Richmond.
	3	Wm. Falls	Carp.
	4	W. A. Shirreff	Fitzroy Harbor.
	5	Wesley Hicks	Kars.
	6	John Watt	Metcalfe.
	7	A. Wilson	Hintonburgh.
Dufferin	1	James McQuarrie	Orangeville.
	2	E. F. Bowes	Shelburne.
	3	A. Cauthers	Stanton.
	4	James McQuarrie	Orangeville.
	5	Alfred Finbow	Grand Valley.
Elgin	1	W. W. White	Aylmer.
	2	Henry Thornton	St. Thomas.
	3	Henry Thornton	St. Thomas.
	4	Duncan McGregor	Eagle.
Essex	1	Alois Master	Sandwich.
	2	William Kelly	Amherstburgh.
		C. Wright	Amherstburgh.
	3	George Malott	Kingsville.
	4	W. L. Hughson	Harrow
	5	J. McGaw	Leamington.
		Jesse T. Brown	Leamington.
	6	Joseph Lupien	Belle River.
	7	Aurele Pacaud	Windsor.
		J. S. Askew	Windsor.
	8	Richard E Millard	Essex Centre.
	9	Raphael Marion	Chevalier.

List of Division Court Bailiffs, etc.—*Continued.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Frontenac	1	George Greenwood	Wolfe Island.
	1	J. A. Gardener	Kingston.
	2	John A. Gardener	Kingston.
	3	Edmund G. Ruttan	Sydenham.
	4	Henry Sly	Veronia.
	5	William J. Arthur	Battersea.
	6	Thomas B. Campbell	Oso Station.
	6	Matthew W. Price	Mountain Grove.
	6	Harmon W. Hunt	Sharbot Lake.
	6	Samuel Mitchell	Plevna.
Grey	1	James Sharpe, jr	Owen Sound.
	2	James Carson	Durham.
	3	George Brown	Meaford.
	4	George Mitchell	Clarksburg.
	5	A. S. Vandusen	Flesherton.
	6	W. B. Simpson	Chatsworth.
	7	John Small	Hanover.
	8	W. G. Pickell	Markdale.
Haldimand	1	E. J. Wigg	Caledonia.
	2	Andrew Finlan	Cayuga.
	3	W. R. McIndoe	Dunnville.
	4	David Byers	Selkirk.
	5	Geo. Brooks	Canboro'.
	6	F. Hartwell	Jarvis.
Haliburton	1	R. C. Garratt	Minden.
	2	John Stothart	Haliburton.
	3	Adam Graham	Ursa.
Halton	1	J. A. Fraser	Milton.
	2	Robert Lucas	Oakville.
	3	Alfred Benham	Georgetown.
	4	William Hemstreet	Acton.
	5	Jackson Worthington	Campbellville.
	6	J. W. Henderson	Burlington.
Hastings	1	John H. Gordon	Belleville.
	2	W. D. Ketcheson	Wallbridge.
	3	W. E. Pearsall	Shannonville.
	4	W. J. Bowell	Tweed.
	5	C. Butler	Stirling.
	6	John Allen Huff	Madoc.
	7	J. G. Ferguson	Deseronto.
	8	Jones Phillips	Foxboro'.
	9	Wm. Henry Garratt	Trenton.
	9	Lewis Cruikshank	Trenton.
	10	James C. Bowen	Marmora.
	11	James Mairs	Lridgewater.
	12	Walter Mullett	Bancroft.
	12	B. H. Sweet	Bancroft.
Huron	1	John Knox	Goderich.
	2	Joseph D. Brine	Seaforth.
	3	D. Dickenson	Clinton.
	4	Finlay S Scott	Brussels.
	5	John Gill	Exeter.
	6	Joseph Mallough	Dungannon.
	7	J. Ferguson	Bayfield.
	8	Francis Patterson	Wingham.
	9	John Brethauer	Wroxeter.
	10	Phillip Sipple	Zurich.
	11	J. Beanes	Crediton.
	12	James Davis	Blyth.

List of Division Court Bailiffs, etc.—*Continued.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Kent	1	Charles J. Moore	Chatham.
		T. H. Nelson	Chatham.
	2	Wm. Teetzel	Ridgetown.
	3	Alex. Cuthbert	Dresden.
	4	W. Fellows	Blenheim.
		John M. Burke	Blenheim.
	5	Thomas Forham	Wallaceburg.
	6	G. A. Robier	Thamesville.
		S. J. Thomas	Bothwell.
	7	M. Dillon	Merlin.
Lambton	1	Robert Miller	Sarnia.
	2	J. F. Elliott	Watford.
	3	Richard L. Bobier	Forest.
	4	N. Cornwall	Sombra.
	5	Eugene Mason	Wyoming.
	6	J. G. Braddon	Thedford.
	7	John McGill	Corunna.
	8	John Sinclair	Petrolia.
	9	W. Fitzpatrick	Alvinston.
Lanark	1	P. J. Lee	Perth.
		James Patterson	Perth.
	2	Jas. D. McInnes	Lanark.
	3	John McPherson	Carleton Place.
	4	Jas. Murray	Smith's Falls.
	5	Arthur H. Ellis	Pakenham.
	6	John Slattery	Almonte.
Leeds and Grenville	1	H. McPhail	Brockville.
		Uri Marshall	Brockville.
	2	Chas. H. Rowe	Prescott.
	3	Edward McE. Hiscocks	Gananoque.
	4	J. Dickinson	Kemptville.
	5	P. Dowdall	Merrickville.
	6	W. H. Denaut, jr	Delta.
		S. R. Ransom	Delta.
	7	R. Richards	Frankville.
	8	Chester Stewart	Newboro'.
		Delorma Deacon	Westport.
	9	G. W. Brown	Athens.
	10	Wm. Stitt, jr	Spencerville.
		Jas. P. Lawrence	Spencerville.
	11	S. J. Whaley	North Augusta.
	12	W. J. Mallory	Mallorytown.
Lennox and Addington	1	Z. Ham	Napanee.
	2	R. R. Finkle	Bath.
	3	D. Daverne	Adolphustown.
	4	Z. Ham	Napanee.
	5	P. Vandewater	Centreville.
	6	John W. Denyes	Odessa.
	7	P. F. Carscallen	Tamworth.
		Andrew Cowan	Vennachar.
		Thos. Neal	Cloyne.
Lincoln	1	P. Henigan	Niagara.
	2	Richard E. Boyle	Merritton.
	3	A. D. Lacey	Smithsville.
	4	Jas. F. Carter	Beamsville.

List of Division Court Bailiffs, etc.—*Continued.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Manitoulin	1	Neil McLean, jr	Gore Bay.
	2	D. McKenzie	Little Current.
	3	John Gorley	Manitowaning.
Middlesex	1	John Burns	London East.
	2	Edward Manes	Parkhill.
	3	G W. Hodgins	McGillivray.
	4	Henry Lockwood	Delaware.
	5	John A. McAlpin	Glencoe.
	6	Thomns O. Curry	Strathroy.
	7	John Beverley	Dorchester Station.
	8	Wm. Guest	St. John.
	9	L. W. Stevens	London.
Muskoka	1	W. J. Hill	Bracebridge.
	2	T. M. Robinson	Gravenhurst.
	3	C. Peacock	Huntsville.
	4	Roger Mahon	Port Carling.
	1	Louis Joudouin	Sturgeon Falls.
	2	X. Ranger	Mattawa.
	3	Chas. Lamarche	Mattawa.
	4	M. J. Powell	Sudbury.
Norfolk	1	E. G. Wells	Simcoe.
	2	Edward Grace	Waterford.
	3	D. C. Wood	Simcoe.
	4	Robert Power	Delhi.
	5	Jos. W. Shearer	Vittoria.
	6	Henry C. Ellis	Port Rowan.
	7	H. J. Mitchener	Clear Creek.
	8	Hiram Fairchild	Port Dover.
Northumberland and Durham	1	Henry Metcalfe	Bowmanville.
	2	N. A. Jerome	Orono.
	3	John Grimson	Port Hope.
	4	Wm. Carveth	Millbrook.
	5	O. Dean	Cobourg.
	6	Thomas Patterson	Grafton.
	7	John Reives	Colborne.
	8	Wm. Martin	Brighton.
	9	Luke Berry	Warkworth.
	10	Arthur Terrill	Wooler.
	11	Thos. G. Gillespie	Campbellford.
Ontario	1	J. W. Palmer	Whitby.
	2	Levi McKay	Greenwood.
	3	James D. Paxton	Port Perry.
	4	J. C. Widdifield	Uxbridge.
	5	R. J. Harwood	Cannington.
	6	James C. Edgar	Beaverton.
	7	Joseph Fox	Millington.

List of Division Court Bailiffs, etc.—*Continued.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Oxford	1	M. Virtue	Woodstock.
	2	L. S. Kennedy	Richwood.
	3	Geo. C. McKay	Embro.
	4	Wm. Stroud	Norwich.
	5	W. H. Cody	Ingersoll.
	6	M. Dillon	Tilsonburg.
Parry Sound	1	T. W. George	Parry Sound.
		Jas. Coff	Byng Inlet.
	2	W. J. Moffatt	McKellar.
	3	Jas. G. Dixon	Rosseau.
	4	Chas. W. McKague	Burk' Falls.
	5	William E. Kennedy	Magnetawan.
	6	David Ricker	Commanda.
	7	Archibald McDonald	Sundridge.
Peel	1	Geo. William Broddy	Brampton.
	2	John H. Glendening	Streetsville.
	3	James K. Leslie	Caledon.
	4	J. C. Switzer	Albion.
Perth	1	Thos. Tobin	Stratford.
		Thos. S. Tobin	Stratford.
	2	J. S. Coppin	Mitchell.
	3	William Box	St. Mary's.
	4	J. W. Donaldson	Shakespeare.
	5	W. D. Weir	Milverton.
	6	W. H. Hay	Listowel.
Peterborough	1	Joseph Griffin	Peterborough.
	2	A. R. Anderson	Norwood.
	3	Joseph Elmhirst	Keene.
	4	Thos. Nicolls	Lakefield.
	5	Chas. R. Hawk	Apsley.
Prescott and Russell	1	S. Wright	L'Orignal.
	2	Thomas Shields	Vankleek Hill.
	3	P. Kelly	St. Eugene.
	4	Wm. Adolphus McKay	Plantagenet.
	5	Docitte Lavergne	Cumberland.
	6	Thomas Young	Russell.
	7	S. Wright	L'Orignal.
	8	C. Gates	Fournier.
		Napoleon Dupuis	St. Isidore.
	9	Jules Boileau	Alfred.
	10	John A. Dent	Rockland.
		Frs. Menard	Clarence Creek.
	11	E. M. Casselman	Casselman.
Prince Edward	1	A. M. Buchanan	Picton.
	2	Marshall Palen	Milford.
	3	George Farrell	Demorestville.
	4	A. Harvey	Ameliasburg.
	5	Chas. Herrington	Wellington.
	6	Alex. McDonald	Hallowell.
	7	Harman W. Weeks	Consecon.
	8	E. A. Williams	Waupoose.

List of Division Court Bailiffs, etc.—*Continued.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Rainy River	1	W. H. McKay	Rat Portage.
	2	Wm. Neil	Fort Francis.
Renfrew	1	George Mitchell	Pembroke.
		James Millar	Pembroke.
	2	A. Acheson	Westmeath.
		Jno. Beaupre	Beachburg.
	3	S. O'Gormau	Renfrew.
		Wm. Wilson	Arnprior.
	4	John Lyon	Arnprior.
	5	Alex. Gorman	Shamrock.
	6	Hugh Gallagher	Eganville.
	7	George Marshall	Cobden.
	8	John Hartney	Rockingham.
Simcoe	1	John Weaymouth	Barrie.
	2	L. Algeo	Bradford.
	3	Jno. Wilson	Tottenham.
	4	A. W S. Cunningham	Collingwood.
	5	James Martin	Hillsdale.
	6	J. G. Wilson	Orillia.
	7	Andrew Patton	New Lowell.
	8	W. H. McDougall	Alliston.
	9	A. Smeath	Penetanguishene.
	10	Thomas Blaney	Coldwater.
Stormont, Dundas and Glengarry	1	J. A. Robertson	Lancaster.
	2	Colin A. McLauren	Dalkeith.
	3	D. McDonald	Cornwall.
		Homer Stiles	Cornwall.
	4	H. Bush	Lunenberg.
		Simon Warner	Osnabruck Centre.
	5	Jacob Hopper	Morrisburg.
	6	Wm A. Coons	Iroquois.
	7	Edward Barclay	Inkerman.
	8	Samuel Dillebough	Crysler.
	9	Wm. Cameron	Lancaster.
	10	A. Stallmayer	Chesterville.
	11	Martin Malony	Monckland.
	12	H. A. Conroy	Maxville.
Thunder Bay	1	Jas. Alexander	Port Arthur.
	2	Joseph McKinnon	English River.
	3	Jas. Alexander	Port Arthur.
Victoria	1	Arch. J. Smith	Woodville.
	2	Stephen Nevison	Fenelon Falls.
	3	Thomas Cheetham	Bobcaygeon.
	4	Wm. Glass	Omemee.
	5	John Matthie	Lindsay.
	6	Wm. Henry McLaughlin	Oakwood.
	7	William Boden	Victoria Road.
Waterloo	1	J. Klippert	Berlin.
	2	Peter Gillies	Galt.
	3	Peter Gillies	Galt.
	4	Alex. Fraser	New Hamburg.
	5	Benj J. Ballard	Hawkesville.
	6	Benj. J. Ballard	Hawkesville.
	7	Ed. Bourchier	Washington.

List of Division Court Bailiffs, etc.—*Concluded.*

County.	No. of Division.	Name of Bailiff.	Post Office Address.
Welland	1	Casper Ramey	Welland.
	2	John S. Stayzer	Marshville.
	3	J. Teal	Bertier.
	4	J. D. Fralick	Niagara Falls, South.
	5	Lanson Theal	Thorold.
	6	Elias Augustine	Port Colborne.
Wellington	1	John H. Doughty	Guelph.
	2	J. H Doughty	Aberfoyle.
	3	Wm. Hemstreet	Acton.
	4	Wm. M. Frank	Fergus.
	5	James Broddy	Erin.
	6	Wm. Findlay	Elora.
	7	S. B. Trask	Glen Allan.
	8	David T. Small	Arthur.
	9	James McQuarrie	Orangeville.
	10	Henry Torrance	Harriston.
	11	A. Godfrey	Mount Forest.
Wentworth	1	Wm. Hunter	Hamilton.
	2	F. P. Hanes	Dundas.
	3	Wm. Harvey	Waterdown.
	4	Emerson Clement	Troy.
	5	J. C. Moore	Stoney Creek.
	6	E. P. Hanes	Dundas.
	7	A. de C. Boyes	Binbrook.
	8	A. de C. Boyes	Binbrook.
	9	J. Greenfield	Hamilton.
York	1	J. M. Wingfield	Parkdale.
		St. John Severs	Toronto.
	2	James Stewart	Toronto.
	3	James Stewart	Toronto.
	4	Wm. Malloy	Newmarket.
		Amos H. Wilson	Newmarket.
	5	R. A. Sheppard	Sutton, West.
	6	James W. Crossley	King City.
	7	James Stewart	Toronto.
	8	James Stewart	Toronto.
	9	W. Luke	West Hill.
	10	Peter Small	Toronto.

TABLE D.

DIVISION COURTS AND THE LIMITS OF THE RESPECTIVE DIVISIONS IN THE PROVINCE OF ONTARIO.

DISTRICT OF ALGOMA.

1.—Bounded west by Thunder Bay District, 85th parallel of west longitude, and east by Barr River, including all the islands in front.

2.—Bounded west by Barr River, and east by the westerly boundary of the Townships of Thessalon River, Kirkwood, Bridgeland and Houghton, and by said boundary line of the last three named townships produced northerly.

3.—Bounded west by the westerly boundary of the Townships of Thessalon River, Kirkwood, Bridgeland and Houghton, and the boundary line of the last named three townships produced northerly, and on the east by the eastern boundary of the Township of Sprague, produced northerly.

4. Bounded on the west by the boundary line between the Townships of Sprague and Lewis, produced north to the northern boundary of the District of Algoma, thence along the northern boundary of the said district, thence south along said eastern boundary to the waters of Lake Huron, thence westerly along the southern boundary of the District of Algoma, to a point opposite the boundary line between the Townships of Sprague and Long, thence northerly to said last mentioned boundary line, thence easterly along the said southern boundary line of the Township of Sprague to the place of beginning.

6.—Consisting of St. Joseph's Island.

COUNTY OF BRANT.

1.—The City of Brantford and that part of the Township of Brantford not included in the other divisions hereinafter described. The Townships of Onondago and Tuscarora, and that part of the Township of Brantford lying south of the main road from Brantford to Hamilton and east of Fairchild's Creek.

2 —The Town of Paris and that part of South Dumfries west of the line between lots 18 and 19, and that part of the first concession of the Township of Brantford lying west of a continuation of the last mentioned line.

3.—The remainder of the Township of South Dumfries and of the first concession of the Township of Brantford.

4.—The ten northern concessions of the Township of Burford, and that part of the 2nd, 3rd, 4th and 5th concessions of the Township of Brantford, west of the line between ots numbers 10 and 11, and that portion of the Kerr Tract west of a continuation of the last mentioned line.

5.—The Township of Oakland, the four southern concessions of the Township of Burford and lots numbers 1 to 5, inclusive, in the ranges east and west of the Mount Pleasant Road, in the Township of Brantford, adjoining the Township of Oakland.

COUNTY OF BRUCE.

1.—The Town of Walkerton and Township of Carrick, and all the Township of Brant south of the line between the 11th and 12th concessions.

2.—The Village of Teeswater, all the Township of Culross, and that part of the Township of Greenock lying south of the line between the 11th and 12th concessions and Village of Lucknow, and all of Kinloss Township not in number nine.

3.—The Town of Kincardine and that part of the Township of Kincardine lying south of a line drawn between the 9th and 10 concessions.

4.—The Village of Paisley and that part of the Township of Brant lying north of a line drawn between the 11th and 12th concessions of the Township of Brant.

All the Township of Elderslie, except lots 16 to 36, both inclusive, in concessions 12, 13 and 14 of said Township.

All the Township of Greenock lying north of a line drawn between concessions 11 and 12 of said Township.

Lots 26 to 35, both inclusive, in the 8th, 9th, 10th, 11th, 12th, 13th and 14th concessions of the Township of Bruce; and that part of the Township of Saugeen lying east of a line between lots 28 and 29, and south of the production of the town line between the Townships of Arran and Elderslie to the Saugeen River.

5.—All Saugeen Township not included in No. 4, all that part of the Township of Arran lying west of a line between lots 10 and 11 and north of Arran Lake and the outlet of said lake, and that part of the Township of Amabel lying south of the 10th concession of Amabel, and the Villages of Port Elgin and Southampton.

6.—The Village of Tiverton, and that portion of Kincardine Township north of a line drawn between concessions 9 and 10 in said Township, and all the Township of Bruce, except that part included in No. 4.

7.—That part of the Township of Elderslie not included in No. 4, and that part of Arran Township not included in No. 5, and the Village of Tara.

8.—The Village of Wiarton, the Township of Albemarle, and that part of the Township of Amabel lying north of a line between the 9th and 10th concessions.

9.—All the Township of Huron, and that part of the Township of Kinloss, described as follows :—

Commencing at the boundary line between said Townships of Huron and Kinloss, at a point at which the blind line between the 12th concession of said Township of Kinloss

and the third range south of the Durham Road, in the said Township of Kinloss, commences; thence in an easterly direction along said blind lane to the westerly side of the Goderich Gravel Road, or the 10th side line of said Township of Kinloss; thence along said 10th side line in a southerly direction to the boundary line of the County of Huron; thence in a westerly direction along said last mentioned boundary to the said line between Huron and Kinloss aforesaid; thence northerly along said last named boundary line to the place of beginning.

10.—All the Townships of Eastnor, Lindsay and St. Edmunds.

COUNTY OF CARLETON.

1.—Comprising all the City of Ottawa, and the Township of Gloucester, to lot 15, inclusive, Rideau front and concessions 1 to 6, inclusive, Ottawa front and the islands in the Ottawa River opposite thereto.

2.—All the Township of Goulbourn; the 8th, 9th and 10th concessions of the Township of Marlborough; all that portion of the Township of Nepean south of the River Goodwood; and the 4th, 5th and 6th concessions thereof north of the same river to the boundary line between lots 20 and 21 in the last mentioned concessions.

3.—All the Township of Huntley, and all the Township of March, except lots 1 to 5, inclusive, in concessions 1, 2, 3 and 4 thereof.

4.—All the Township of Fitzroy and Torbolton.

5.—All the Township of North Gower; Long Island in the Rideau River and the 1st. 2nd, 3rd, 4th, 5th, 6th and 7th concessions of the Township of Marlborough.

6.—All the Township of Osgoode; the 6th, 7th and 8th concessions Ottawa front and from lots 16 to 30, inclusive, of the Rideau front of the Township of Gloucester.

7.—All the Township of Nepean, except the City of Ottawa, and the part of the said township lying south of the River Goodwood, and concessions 4, 5 and 6 north of said River Goodwood to the boundary line between lots 20 and 21 in said last mentioned concessions, and including also lots 1 to 5, inclusive, in concessions 1, 2, 3 and 4 in the Township of March.

COUNTY OF DUFFERIN.

1.—The Town of Orangeville, the Township of East Garafraxa, and all that portion of the Township of Amaranth lying south of the southerly boundary of lot number 26, in each concession of the Township of Amaranth.

2.—The Village of Shelburne, the Township of Melancthon, and all that portion of the Township of Amaranth lying north of the southerly boundary of lot number 23, in each concession of the Township of Amaranth.

1.—The Township of Mulmur.

4.—The Township of Mono.

5.—The Township of East Luther.

COUNTY OF ELGIN.

1.—The Townships of Bayham, Malahide and South Dorchester.

2.—The Townships of Southwold and Yarmouth (except the City of St. Thomas).

3.—The City of St. Thomas.

4.—The Townships of Aldborough and Dunwich.

COUNTY OF ESSEX.

1.—Town of Sandwich and Township of Sandwich West.

2.—Town of Amherstburgh and Townships of Alden and Anderdon.

3.—The Village of Kingsville, and all that part of the Township of Gosfield not included in Division No. 8.

4.—The Township of Colchester South, and all that part of Colchester North, south of the 9th concession, exclusive of the said concession and the lots on both sides of Malden Street.

5.—Township of Mersea and Village of Leamington.

6.—The Township of Rochester, the Village of Belle River, the first concession of the Township of Maidstone, and all north of the Middle Road in said Township of Maidstone.

7.—Town of Windsor, the Town of Walkerville, and all that part of Sandwich East, north of the Talbot Street range.

8.—The Town of Essex, all that part of the Township of Maidstone lying west of the first concession and south of the Middle Road ; so much of Sandwich East as is south of Talbot Street, including the lots on both sides of said street to Nos. 306 and 307 ; all of Colchester north of the 9th concession, including said concession and lots on both sides of Malden Street, and all that part of Gosfield lying north of concession 6, and extending as far east from the limits between Gosfield and Colchester as lot No 12, including such lot in each concession north of concession 6 inclusive.

9.—The Township of Tilbury West.

COUNTY OF FRONTENAC.

1.—City of Kingston, Township of Garden Island, Wolf Island, Howe Island and part of the Township of Pittsburg.

2.— Cataraqui, comprising the Township of Kingston and the Village of Portsmouth

3.—Loughboro', comprising the Townships of Loughboro' and Bedford.

4.—Verona, comprising the Townships of Portland and Hinchinbrooke.

5.—Sunbury, comprising the Township of Storrington and part of the Township of Pittsburg.

6.—Comprising the Townships of Kennebec, Olden, Oso, Barrie, Clarendon, Palmerston, Miller, North Canonto and South Canonto.

COUNTY OF GREY.

1.—The Town of Owen Sound, the Village of Brook, and the Townships of Derby, Keppel, Sarawak and Sydenham.

2.—The Town of Durham, the Township of Egremont, and those portions of the Townships of Bentinck, Normanby and Glenelg, as follows:—That part of the Township of Bentinck lying east of the line between lots 30 and 31 in the 1st, 2nd and 3rd concesaions south of the Durham Road, and in concessions 1, 2 and 3 north of the Durham Road, and east of the line between lots 15 and 16 in concessions 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 thereof. That part of the Township of Normanby lying east of the line between lots 20 and 21, in the 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th and 18th concessions, and all the Township of Glenelg, excepting that portion lying east of the line between lots 10 and 11 in the 7th, 8th, 9th, 10th 11th, 12th, 13th, 14th and 15th concessions thereof.

3.—The Town of Meaford, the Township of St. Vincent, and that part of the Township of Euphrasia lying west of the line between the 6th and 7th concessions and north of the line between lots 15 and 16.

4.—The Township of Collingwood and the east half of the Township of Euphrasia, excepting that part thereof lying west of the line between the 4th and 5th concessions, and south of the lots between lots 12 and 13, and east half of the Township of Osprey.

5.—The Township of Proton, the west half of the Township of Osprey, and those parts of the Township of Artemesia, consisting of the ranges of lots lying parallel to the Toronto and Sydenham Road, and south of the line between lots 130 and 131, and concessions 1, 2 and 3 south of the Durham Road, and 1, 2, 3, 4, 5 and 6 north of the said Durham Road, and those portions of concessions 7, 8 and 9 lying east of the ranges of lots parallel with the Toronto and Sydenham Road, and those portions of concessions 10, 11, 12, 13 and 14 lying east of the line between lots 30 and 31.

6.—The Township of Sullivan and the Township of Holland, excepting those portions of concessions 9, 10, 11 and 12 lying south of the line between lots 15 and 16, and those portions of concessions 7 and 8 west of the ranges of lots lying parallel with the Toronto and Sydenham Road, and the ranges of lots lying parallel with the Toronto and Sydenham Road, and south of the line between lots 50 and 51.

7.—All the lots from 1 to 30 inclusive, in the three concessions south, and the three concessions north or the Durham Road, in the said Township of Bentinck; and all the lots from 1 to 15, inclusive, in the 12th concession, from the 4th to the 15th concessions, inclusive, of the said Township of Bentinck; and all the lots from 1 to 20 inclusive, in all the concessions from 4 to 18, inclusive, in the Township of Normanby aforesaid.

8.—All the lots from 51 to 130, inclusive, in all the concessions parallel, to (and being north-east and south-west), of the Toronto and Sydenham Road, in the Townships of Artemesia, Glenelg and Holland aforesaid; all lots to the westward of the dividing line between lots 30 and 31, in all the concessions from 10 to 14, inclusive, and all the lots from 1 to 5 in the 7th 8th and 9th concessions, inclusive, which lie to the south-west of the 3rd concession, south-west of the said Toronto and Sydenham Road, in the said Township of Artemesia; all the lots from 1 to 12, inclusive, in concessions 5 and 6, and the lots from 1 to 15, inclusive, in the concessions from 7 to 12, inclusive, in the Town-

ship of Euphrasia ; all lots south of the allowance for road between lots 15 and 16 in the 9th, 10th, 11th and 12th concessions, and from lot 25 to 30, inclusive, in the 7th concession, and lots 28, 29 and 30 in the 8th concession of the said Township of Holland ; and all the lots lying east of the allowance for road between lots 10 and 11, in all the concessions from 7 to 15, inclusive, in the said Township of Glenelg

COUNTY OF HALDIMAND.

1.—All the Township of Seneca, except the first and second concessions, the Young tract, and the property of the late Richard Martin, and the late Robt. Weir ; all the Township of Oneida, except the first range north of the Cayuga line ; the Dennis tract and the lots southerly of said tract.

2.—The whole of the Township of North Cayuga, except that portion thereof lying north-east of side line between lots 12 and 13 ; the first and second cocessions of the Township of Seneca, excepting that portion thereof lying north-east of the side line between lots 12 and 13 ; the Young tract, and the lands of the late Robert Weir and the late Richard Martin, Esquires ; the first range of Oneida and north of Cayuga line ; also the Dennis tract and river lots lying south.

3.—The Township of Moulton, Sherbrooke and Dunn, including the Village of Dunnville.

4.—The Townships of South Cayuga and Rainham.

5.—The Township of Canboro, and those portions of North Cayuga and Seneca not included in the other divisions.

6. The Township of Walpole.

COUNTY OF HALIBURTON.

1.—The Township of Glamorgan and Snowden, except that portion of both, included in the 3rd division, and all of the Townships of Snowden, Lutterworth, Minden, Anson, Stanhope, Hindon, Sherbourne and McClintock.

2.—The Townships of Dysart, Guilford, Havelock, Livingstone, Lawrence, Eyre, Harburn, Dudley, Harcourt, Bruton, Clyde and Nightingale and that portion of Monmouth not included in the 3rd division.

5.—The Township of Cardiff, the Township of Monmouth (except lots 1 to 19 inclusive) in the 13th, 14th, 15th, 16th and 17th concessions ; the south 12 concessions of the Township of Glamorgan, and from lots 21, inclusive, to the eastern boundary in the south six concessions of Snowden.

COUNTY OF HALTON.

1.—All the territory comprised in the new survey of the Township of Trafalgar, and the first ten lots in concessions 1, 2, 3, 4, 5 and 6 in the Township of Esquesing, and the first five lots in concessions 7, 8, 9, 10 and 11 in said township.

2.—That part of theTownship ofTrafalgar known as the Old Survey.

3.—All the rest of the territory comprised in concessions 8, 9, 10 and 11 in the Township of Esquesing not comprised in the first division.

4.—All the rest of the territory comprised in concessions 1, 2, 3, 4, 5 and 6 in the Township of Esquesing.

5.—The Township of Nassagaweya.

6.—The Township of Nelson.

COUNTY OF HASTINGS.

1.—To comprise the City of Belleville.

2.—To comprise all that part of the Township of Sidney which lies east of the line between lots Nos. 6 and 7 in the several concessions and south of the 9th concession.

3.—The Township of Tyendinaga, except that part called Deseronto.

4.—The Township of Hungerford.

5.—All that part of the Township of Sidney which lies to the north of the 8th concession, and to the east of lot No. 6 in each concession north of the 8th concession, and all that part of the Township of Rawdon which lies to the south of the 9th concession, and that part of the Township of Huntingdon south of the 6th concession.

6.—The Townships of Madoc, Tudor, Limerick, excepting that part lying north of the 10th concession, and also that part lying west of lots 25 in the different concessions south of the 11th concession of said township, and including all that part of the Township of Huntingdon north of the 6th concession of said township.

7.—The Village of Deseronto.

8.—The Township of Thurlow.

9.—The Town of Trenton, and all that part of the Township of Sidney which lies to the west of lot No. 7 in each of the concessions of the said township, including Mill Island.

10.—The Townships of Marmora, Lake, and all that part of the Township of Rawdon which lies to the north of the 8th concession.

11.—The Townships of Elzevir, Grimsthorpe, Cashel, excepting that part of Cashel lying north of the 10th concession of the said township.

12.—The Townships of Wollaston, Faraday, Herschel, McClure, Wicklow, Bangor, Carlow, Monteagle, Dungannon, Mayo, and all that part of the Township of Cashel lying north of the 10th concession of said township, and all those parts of the Township of Limerick lying north of the 10th concession, and west of lot No. 25 in the several concessions of the said Township of Limerick.

COUNTY OF HURON.

1.—Comprising that part of the Township of Goderich to the north of the Cut Line and the Huron Road until the same meets the road allowance between the 13th and 14th concessions; then back along the Huron Road to its junction with the Cut Line; then west by the road allowance between concessions 11 and 12 to the River Maitland; then along the River Maitland to Goderich, together with the Township of Colborne.

2.—Comprising the Township of McKillop, the Town of Seaforth, and all that portion of the Township of Tuckersmith not included in the Third Division, south of the blind line between the 7th and 8th concessions of the said Township of Hullett.

3.—Comprising the Township of Hullett; that part of the Township of Goderich not included in Nos. 1 and 7; 1st, 2nd, 3rd and 4th concessions Township of Stanley; 1st

and 2nd concession Township of Tuckersmith, L. R. S., north of lot 15, and that portion west of side road between lots 25 and 26, H. R. S., and Town of Clinton.

4.—Comprising the Township of Grey; all of the Township of Morris east of side road between lots numbers 10 and 11 (which is not included in No. 12; and the Village of Brussels.

5.—Comprising the Townships of Usborne and Stephen, and the Village of Exeter

6.—Comprising the Townships of Ashfield and West Wawanosh, except that portion east of Maitland River.

7. Comprising the Township of Goderich south of Cut Line and Huron Road until the same joins the road between the 12th and 14th concessions of the Township of Goderich; thence along the said concessions until the same joins the River Bayfield; all Stanley not included in number 3; and the Village of Bayfield.

8.—Comprising the Village of Wingham, the Township of Turnberry, all that par- of East Wawanosh not included in number 12, and all the Township of Morris not included in Nos. 4 and 12.

9.—Comprising the Township of Howick and the Village of Wroxeter.

10.—Comprising the Township of Hay.

11.—Comprising the Township of Stephen.

12.—Commencing at the north-east angle of the Township of Hullett, thence southerly along the easterly boundary of the said Township of Hullett to the blind line, between the 7th and 8th concessions of said township; thence westerly along said line to the western boundary of the township; thence northerly along the westerly boundary of the township to the Maitland River at the south-eastern corner of the Maitland Block; thence along the said river northerly till the western boundary of East Wawanosh is reached; thence northerly along said westerly boundary to the road running between the 6th and 7th concessions of said Township of East Wawanosh; thence easterly along said road to the easterly limit of said township; thence northerly along the gravel road to the road running between the 5th and 6th concessions of the Township of Morris; thence easterly along said road to the line between lots 10 and 11; thence southerly along said line to the line between the 6th and 7th concessions; thence easterly along said line to the line between lots 15 and 16; thence southerly to the boundary line between the Townships of Morris and Hullett; thence easterly to the place of beginning, including the Village of Blyth.

COUNTY OF KENT.

1.—The First Division to consist of the Town of Chatham and that part of the Townships of Dover East and West to the south of the 12th and 13th concession line of the Township of Dover East; and that part of the Township of Chatham south of the 12th and 13th concession line, and west of the side road between lots 12 and 13, from the first mentioned 12th and 13th concession line to the 5th and 6th concession line, and all south of the said 5th and 6th concession line of said township; that part of the Township of Harwich north of 5th and 6th concession line by the eastern boundary; that part of the Township of Raleigh north of the 16th concession to the west side road between lots 12 and 13 north to the 6th and 7th concession line, and all of the said township north of the said last mentioned line, and that part of the Township of Tilbury East north of the 4th concession.

2.—The Second Division to consist of that part of the Township of Howard south of the 2nd and 3rd concession line by the eastern boundary (known as the Botany Road), and that part of the Township of Orford south of the 10th and 11th concession line of said township.

3.—The 3rd division to consist of all that part of the Gore of Camdem lying west of the 10th and 11th concession line, and that part of the Township of Camdem lying west of the side line between lots 6 and 1; the Village of Dresden; and that part of the Township of Chatham north of the 5th and 6th concession line and east of the side road between lots 12 and 13.

4.—The Fourth Division to consist of that part of the Township of Harwich south of the 5th concession of the eastern boundary, and south of the 3rd concession by the western boundary, and that part of Raleigh south of the 15th concession and east of the side road between lots 12 and 13, and the road to the Lake shore through lot 146 on the Talbot road.

5.—The Fifth Division to consist of the Village of Wallaceburg, the Gore of Chatham, and that part of the Township of Chatham north-west of the 12th and 13th concession line and west of the said road between lots 12 and 13, and that part of Dover East lying north of the 12th and 13th concession side road.

6.—The Sixth Division to consist of that part of the Township of Howard, north of the Botany Road aforesaid, and of that part of the Township of Orford north of the 10th and 11th concession line, the Township of Zone, the Town of Bothwell, the Village of Thamesville, and that part of the Gore of Camden east of the 10th and 11th concession line, and that part of the Township of Camden east of the side line between lots 6 and 7.

7. The Seventh Division to consist of that part of Tilbury East south of the 3rd concession, the Township of Romney, and that part of the Township of Raleigh, south of the 6th and 7th concession line and west of the side road between lots 12 and 13 in the said Township, and the road through lot 147 on Talbot road.

COUNTY OF LAMBTON.

1.—The external boundaries of the Township of Sarnia and the Town of Sarnia.

2.—The external boundaries of the Township of Warwick, including that portion of the Village of Arkona south of the township line.

3.—The external boundaries of the Townships of Euphemia and Dawn.

4.—The external boundaries of the Township of Sombra.

5.—The external boundaries of the Township of Plympton.

6.—The external boundaries of the Township of Bosanquet, including that portion of the Village of Arkona north of the township line.

7.—The external boundaries of the Township of Moore.

8. The external boundaries of the Township of Enniskillen.

9 .The external boundaries of the Township of Brock.

COUNTY OF LANARK.

1.—The Townships of Drummond, Bathurst, South Sherbrooke, Burgess North, and that part of the Township of Elmsley North, north of the Rideau River, within the County of Lanark and west of lot No. 12 in each concession.

2.—The Townships of Lanark, Dalhousie, Darling, Lavant and North Sherbrooke.

3.—The Township of Beckwith, and the first six lots in the first seven concessions of the Township of Ramsay.

4.—The Township of Montague, and that part of the Township of North Elmsley from lot No. 1 to lot No. 12 in each concession, both inclusive.

5.—The Township of Pakenham.

6.—The Township of Ramsay, with the exception of the first six lots on the first seven concessions of the said township.

UNITED COUNTIES OF LEEDS AND GRENVILLE.

1.—To consist of the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th concessions and broken front of the Township of Elizabethtown, and the concession roads between them.

2.—To consist of the 1st, 2nd, 3rd, 4th and 5th concessions, and broken front, and that part of the 6th, 7th, and 8th concessions from the town line of Edwardsburgh, to lot number 18; inclusive of the Township of Augusta, and the concession roads between them.

3.—To consist of the 1st, 2nd, 3rd, 4th and and 5th concessions and broken front, of the Townships of Leeds and Lansdowne, respectively, and the concession roads between them.

4.—To consist of the Township of South Gower, the Township of Oxford, from the west side line of lot numbers 11 in all the concessions of the eastern boundary of the township, and the gore of land between South Gower, Oxford and Edwardsburgh.

5.—To consist of the Township of Wolford (except the 7th and 8th concessions and the allowance of road between them), lots numbers 1 to 10, inclusive, in the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions of the Township of Oxford, and the allowance of roads within and between them.

6.—To consist of the Townships of Bastard and Burgess, and those parts of the Townships of Leeds and Lansdowne, on the north side of the rear of the 5th concession in each respectively.

7.—To consist of the Townships of Kitley and Elmsley.

8.—To consist of the Townships of North Crosby and South Crosby.

9.—To consist of that part of the Townships of Escott and Yonge, in rear of the 4th concession of Yonge, and in the rear of the 6th concession of Escott; that part of the Township of Elizabethtown, in rear of the 7th concession, and west of lot number 18 in the 8th, 9th, 10th and 11th concessions, and the allowances for roads embraced therein.

10. To consist of the Township of Edwardsburgh.

11.—To consist of that part of the Township of Augusta, in rear of 5th concession and west of lots numbers 18, in the 6th, 7th and 8th concessions; the whole of the 9th and 10th concessions of the Township of Augusta; the Gore between the Townships of Oxford, Wolford and Augusta; that part of the Township of Elizabethtown in rear of the 7th concession, and east of the commons, between lots numbers 18 and 19 in the 8th, 9th and 10th concessions; the 7th and 8th concessions of the Township of Wolford; lots numbers 1 to 10, inclusive, in the 9th and 10th concessions of the Township of Oxford; and the allowances for roads embraced therein.

12.—To consist of the 1st, 2nd, 3rd and 4th concessions and broken front of the Township of Yonge; the 1st, 2nd, 3rd, 4th, 5th and 6th concessions and broken front of the Township of Escott, and the allowances for roads embraced therein.

The said 1st, 2nd, 3rd and 12th divisions shall, respectively, embrace and comprehend within their limits those portions of the River St. Lawrence, and Islands therein, within the exterior side lines of which such portions of said river and islands would lie and be, if such exterior side lines were produced and extended in that direction to the utmost limits of the Province.

COUNTY OF LENNOX AND ADDINGTON.

1.—The Town of Napanee; Township of Richmond; all that part of North Fredericksburg and Adolphustown lying north of Hay Bay; and all that part of North Fredericksburg lying north of Big Creek.

2.—Comprises 1st concession of Ernestown, the Village of Bath, the Township of Amherst Island, and the 2nd, 3rd and 4th concessions of the said Township of Ernesttown, from the west limits thereof to the west limit of lot No. 21, in each concession.

3.—Township of south Fredericksburg and all that part of North Fredericksburg and Adolphustown, not included in Division No. 1.

4.—1st, 2nd and 3rd concessions of the Township of Camden and the Village of Newburg.

5.—All that part of the Township of Camden not included in Division No. 4.

6.—All that portion of the Township of Ernestown, not included in the limits of Division No. 2.

7.—Townships of Sheffield, Kaladar, Anglesea, Abinger, Effingham, Ashby and Denbigh.

COUNTY OF LINCOLN.

1.—The Town and Township of Niagara.

2.—The Township of Grantham (including the City of St. Catharines, the Villages of Merritton and Port Dalhousie), and the Township of Louth.

3.—The Townships of Caistor and Gainsborough, and the 9th concession of the Township of Grimsby, including the 1st and 2nd ranges as part of the said concession.

4.—The Villages of Grimsby and Beamsville; the Township of Clinton and the Township of Grimsby, except the 9th concession and 1st and 2nd included as part of the said 9th concession.

DISTRICT OF MANITOULIN

1.—The Town of Gore Bay, the Townships of Gordon, Allan, Campbell Mills, Burpee, Robinson, Dawson, the islands known as Cockburn, Barrie, Clapperton and the Duck Islands, and that part of the Township of Billings lying west of the road allowance between lots fifteen and sixteen in the several concessions thereof and so much of the Township of Carnarvon as lies west of Lake Mindemoya and north of the line between the sixth and seventh concessions thereof.

2.—The Town of Little Current, the Township of Howland, and those parts of the Townships of Sheguindah and Bidwell lying north of the line between the sixth and seventh concessions of Sheguindah, and fourth and fifth concessions of the Township of Bidwell, and the sixth and seventh concessions of the line between lots seventeen and eighteen in the Township of Billings and the adjacent islands lying north and east of the said Townships, except the Clapperton Island.

3.—Manitowaning, the Townships of Assiginack, Tehkummah and Sandfield, and those parts of the Township of Sheguindah lying south of the line between the sixth and seventh concessions of Sheguindah, and fourth and fifth concessions of the Township of Bidwell, and the sixth and seventh concessions of the Township of Billings to the line between lots seventeen and eighteen of said township, and the Township of Carnarvon, except so much of the same as lies west of Mindemoya Lake, and all that part of Manitoulin lling east of the Township of Assiginack, Manitowaning and South Bays and the islands adjacent thereto.

COUNTY OF MIDDLESEX

1.—That part of the City of London lying to the west of Maitland street, with that portion of the Township of London lying south of the line between the 4th and 5th concessions and west of the said street, produced northerly or a line in the same direction to the line between the said 4th and 5th concessions, and with that portion of the Township of Westminster lying west of the main road leading south from Clarke's Bridge across the Thames ; south to the line between the 1st and 2nd concessions ; and westerly to the line between lots 42 and 43, and extending northerly to the River Thames; and also including the Village of London West.

2.—The Villages of Parkhill and Ailsa Craig, the Townships of East Williams and West Williams, and that portion of the Township of Lobo lying north of the line between the 11th and 12 concessions; and east of the line between lots numbers 12 and 13.

3.—The Townships of McGillivray and Biddulph, and the Village of Lucan.

4.—The Township of Delaware, with that portion of the Township of Westminster west of the line between lots 30 and 31, in the second concession; then southerly on the line between lots 20 and 21, to the southerly limit of the township, including all west of said line and also including all that portion of the front of said Township of Westminster, lying west of the line between lots numbers 42 and 43, not included in the first division ; with that portion of the Township of Caradoc lying south of the line, between the 5th and 6th concessions, to the River Thames ; and with that portion of the Township of Lobo, lying south of the line, between the 6th and 7th concessions, to the River Thames.

5.—The Townships of Ekfrid and Mosa, including the Villages of Wardsville, Newbury and Glencoe.

6.—Townships of Adelaide and Metcalfe; the Town of Strathroy, with that portion of the Township of Caradoc lying north of the line, between the 3rd and 4th concessions; with that portion of the Township of Lobo which lies north of the 6th concession, and west of the line between lots 12 and 13 of the said Township.

7.—The Township of North Dorchester, north and South of the River Thames; that portion of the Township of West Nissouri which lies south of the line between lots 14 and 15; and with that portion of the Township of Westminster lying south of the line between the 1st and 2nd concessions, and east of the line between lots 30 and 31, in the second concession, and thence east of the line between lots 20 and 21, continued south to the southerly limit of the said Township of Westminster.

8.—All that portion of the Township of London which lies north of the line between the 4th and 5th concessions; that portion of the Township of Lobo which lies north of the line between the 6th and 7th concessions, and east of the line between lots 12 and 13, to the line between the 11th and 12th concessions, and with all that portion of the Township of West Nissouri which lies north of the line between lots numbors 14 and 15.

9.—That part of the City of London lying east of Maitland street; that part of the Township of London lying south of the line between the 4th and 5th concessions and east of the said street, produced northerly or in a line in the same direction to the line between the said 4th and 5th concessions; and that part of the Township of Westminster lying north of the line between the 1st and 2nd concessions, and east of the main road leading south from Clarke's Bridge, across the Thames.

DISTRICT OF MUSKOKA

1.—The Village of Bracebridge, and the Townships of Macaulay, McLean, Ridout, Monck and Cardwell, concessions 1, 2, 3, 4, 5, 6, 7, 8, and 9 in the Townships of Stephenson, Bruce and Franklin, and that part of the Township of Watt, situated east of lot 21, in the several concessions thereof; and concessions 7, 8, 9, 10, 11, 12 and 13 in the Townships of Muskoka and Draper.

2.—The Village of Gravenhurst; the Townships of Morrison, Ryder and Oakley, and concessions 1, 2, 3, 4, 5 and 6 of the Townships of Muskoka and Draper.

3.—The Village of Huntsville; the Townships of Stisted, Chaffey and Sinclair; and concessions 10, 11, 12, 13 and 14 in the Townships of Stevenson, Brunel and Franklin.

4.—The Townships of Wood, Medora and Humphrey, and that part of the Township of Watt situated west of lot 21 in the several concessions thereof.

DISTRICT OF NIPISSING.

1.—To be composed of the Townships of Springer, Field, Badgerow, Caldwell, Kirkpatrick, Hugel, Rattler, Dunnet, Hagar and Appleby, and all that part of the District of Nipissing which is situated west of the line between the Indian Reserve and the Township of Widdifield, produced north and south, to the boundary of the said District and the east of the eastern boundary of the fourth division.

2.—To be composed of the Townships of Mattawan, Ouimet, Calvin, Papineau, Lauder, Lentland, Boyd, Osler, McLaughlin, Canisby, Sabine, Lyell, Airy, Marchison and Robin.

son, and all that part of the District of Nipissing situated east of the line between the Townships of Bonfield and Calven, produced south to the provisional County of Haliburton, and east of the line between the Townships of Phelps and Olrig, produced north to the Ottawa River.

3.—To be composed of the Townships of Widdifield, Merrick, Mulock, Phelps, Ferris, Bonfield, Boulter, Chisholm, Ballantyne, Wilkes, Biggar, Paxton, Butt, Devine, Hunter, McCraney, Finlayson, Peck, and all that part of the District of Nipissing situated west of the line between the Townships of Phelps and Olrig, produced north to the Ottawa River and east of the eastern boundary of first division.

4.—To be composed of the Townships of McKim, Neelon, Dryden, Awrey, Hawley, Blezard, and all that part of the District of Nipissing which is situated west of the line between the said Township of Awrey and the Township of Hagar, produced north and south to the boundary of the said district.

COUNTY OF NORFOLK.

1.—The Gore of the Township of Woodhouse, and all that part of said Township lying west of the side line between lots 5 and 6, together with that part of the 4th, 5th and 6th concessions lying west of the side line, between lots 12 and 13, including that part of the Town of Simcoe within the same.

2.—The Township of Townsend.

3.—The Township of Windham.

4.—The Township of Middleton.

5.—The Township of Charlotteville.

6.—The Township of Walsingham.

7.—The Township of Houghton.

8.—All that part of the Township of Woodhouse not included in Division No. 1, viz: all that part of the 1st, 2nd and 3rd concessions lying east of the side line, between lots 5 and 6, and that part of the 4th, 5th and 6th concessions lying east of the said line, between lots Nos. 12 and 13 in said Township.

UNITED COUNTIES OF NORTHUMBERLAND AND DURHAM.

1.—Townships of Cartwright and Darlington, and the Town of Bowmanville.

2.—Township of Clarke and Village of Newcastle.

3.—Township of Hope and Town of Port Hope.

4.—Townships of Cavan, Manvers, South Monaghan and Village of Millbrook.

5.—Township of Hamilton and Town of Cobourg.

6.—Townships of Haldimand and Alnwick.

7.—Township of Cramahe and Village of Colborne.

8.—Township of Brighton and Village of Brighton.

9.—Township of Percy and Village of Hastings.

10.—Township of Murray.

11.—Township of Seymour and Village of Campbellford.

COUNTY OF ONTARIO.

1.—Including the Townships of Whitby and East Whitby and the Towns of Whitby and Oshawa.

2.—The Township of Pickering.

3.—The Townships of Reach and Scugog, and the Village of Port Perry.

4.—The Townships of Uxbridge and Scott, and the Town of Uxbridge.

5.—The Township of Brock and the Village of Cannington.

6.—The Township of Thorah, and all that part of the Township of Mara lying south of the line, between the 4th and 5th concessions.

7.—All that part of the Township of Mara, lying north of the line, between the 4th and 5th concessions thereof, and the Township of Rama.

COUNTY OF OXFORD.

1.—Comprising the Town of Woodstock, the Townships of Blanford, East Zorra, East Oxford, and that part of the Township of North Oxford, situated east of lot 16, and that part of West Oxford lying east of lot No. 7, to the Stage Road, thence on the north side of the Stage Road, to where the said road intersects the Township of East Oxford.

2.—Comprises the Township of Blenheim.

3.—Comprises the Township of West Zorra and East Nissouri.

4.—Comprises the Townships of North Norwich and South Norwich and the Village of Norwich.

5.—Comprises all those portions of the Townships of North Oxford and West Oxford not comprised in the 1st Division ; the Town of Ingersoll, and those portions of the 1st and 2nd concession of the Township of Durham west of the Middle Town line.

6.—Comprises the Town of Tilsonburg, and all that portion of the Township of Durham not included in the 5th Division.

DISTRICT OF PARRY SOUND.

1.—The town of Parry Sound, and the Townships of Foley, McDougall, Cowper, and Carling, and all that portion of the District lying to the west of the east boundary of Carling, produced to the French River.

2.—The Townships of McKellar, Croft, Hagerman, Ferguson, and all that portion of the District lying between the east boundary of Ferris and the west boundary of Ferguson, produced to the French River.

3.—Townships of Humphrey, Christie, Monteith and Conger.

4.—Townships of McMurrich, Perry and Armour.

5 —The Townships of Spence, Chapman, Ryerson, Lount, Proudfoot, Bethune and Sinclair.

6.—That Territory bounded on the west by the western boundaries of Townships of Pringle and Patterson, and the western boundary of the Township of Patterson, produced to French River and Lake Nipissing ; on the east by the eastern boundary of the District of Parry Sound, and on the south by the southern boundaries of the Townships of Himsworth, Gurd and Pringle.

7.—The Townships of Machar, Laurier, Strong and Joly.

COUNTY OF PEEL.

1.—Town of Brampton, Township of Chinguacousy and northern Division of Township of Toronto Gore.

2.—Village of Streetsville, Township of Toronto, and southern Division of Township of Toronto and Gore.

3.—Township of Caledon.

3.—Village of Bolton, Township of Albion.

COUNTY OF PERTH.

1.—To consist of all that part of the Township of North Easthope west of the line, between lots 25 and 26, and south of the road between the 8th and 9th concessions, and all that part of the Township of South Easthope west of the side line, between lots 25 and 26 ; all that part of the Township of Downie and Gore north and east of the concession line, between the 10th and 11th concessions and the Oxford Road ; and all the Township of Ellice from the 1st to the 13th concessions, inclusive.

2.—To consist of all that part of the Township of Fullarton not included in Division No. 3, and the Townships of Hibbert and Logan.

3.—To consist of that portion of the Township of Dowine west of the Oxford Road, and south of the concession line between the 10th and 11th concessions ; the Township of Blanshard ; all that part of the Township of Fullarton comprising the 13th and 14th

concessions, and south of a road leading from the Mitchell Road, between lots 24 and 25, east to lot 3 in the 10th concession ; thence east along the line between the 10th and 11th concessions to the town line.

4.—To consist of that part of the Township of North Easthope east of the line, between lots 25 and 26, and north of the 8th concession, inclusive, with the 9th and 10th concessions ; all that part of the Township of South Easthope not included in Division No. 1.

5.—To consist of the Township of Mornington, and all that part of the Township of Elma from lots No. 53 to 72, both numbers inclusive of the 1st concession, and from lots No. 27 to No. 36, both numbers inclusive, in and from the second to the eighteenth concessions, both concessions inclusive, of the said Township of Elma ; and concessions 14, 15 and 16 of the Township of Ellice ; and concessions 11th, 12th, 13th and 14th of the Township of North Easthope.

6.—To consist of the Township of Wallace, and all that part of the Township of Elma from the 1st concession to the 18th concession, both concessions inclusive, and comprising lots Nos. 1 to 52, both inclusive, of the 1st concession, and lots Nos. 1 to 26, inclusive, from the 2nd to the 18th concessions, both concessions inclusive.

COUNTY OF PETERBOROUGH.

1.—Composed of the Town of Peterborough, the Village of Ashburnham, the Townships of North Monaghan and Ennismore, and all that part of the Township of Harvey lying west of Pigeon Lake and south of Bobcaygeon ; and all the Township of Smith lying south of the 7th concession ; and all the Township of Otonabee lying west of the 8th concession and north of lots 21 from the said 8th concession to the western boundary of said Township of Otonabee ; and all the Township of Douro lying south of lots numbered 11 ; and all that part of the Township of Dummer lying south of lots numbered 11 and west of the 5th concession.

2.—Composed of the Townships of Asphodel, Belmont and Methuen, and that part of the Township of Dummer lying east of the 4th concession and south of lots numbered 11.

3.—Composed of all that part of the Township of Otonabee lying east of the 9th concession ; and all that part of said Township of Otonabee lying south of lots numbered 22 and west of the 8th concession.

4.—Composed of all that part of the Township of Smith, lying north of the 6th concession ; and all that part of the Township of Duoro, lying north of lots numbered 10 ; and all that part of the Township of Dummer, lying north of lots numbered 10 ; and also of the Village of Lakefield, and of the Township of Galway ; and all the Township of Harvey, except that portion lying west of Pigeon Lake, and south of Bobcaygeon.

5.—Composed of the Townships of Burleigh, Cavendish, Anstruther and Chandos.

UNITED COUNTIES OF PRESCOTT AND RUSSELL.

1.—Comprises the whole of the Township of Longueuil, the municipality of the Village of L'Orignal, and the first concession of the Township of Caledonia.

2.—Comprises all that part of the Township of West Hawkesbury, extending from the front of the third concession, to the rear of the said township.

3.—Comprises the whole of the township of East Hawkesbury.

4.—Comprises the Township of North Plantagenet, and that part of the Township of South Plantagenet, lying north of the Nation River.

5.—Comprises the whole of the Township of Cumberland.

6.—Comprises the whole of the Township of Russell.

7.—Comprises the two front concessions of the Township of West Hawkesbury, and the municipality of Hawkesbury Village, within the same.

8.—Comprises the Township of Caledonia (excepting the 1st concession of the said township), and also that portion of the Township of South Plantagenet, lying south and east of the Nation River.

9.—Comprises the whole of the Township of Alfred.

10.—Comprises the whole of the Township of Clarence.

11.—Comprises the whole of the Township of Cambridge.

COUNTY OF PRINCE EDWARD.

1.—The Town of Picton, the 2nd and 3rd concessions "Military Track," from the west line of lot No. 13, eastward; Gore "G"; 1st and 2nd concessions north of the Carrying Place; 1st concession south-east of the Carrying Place, and 2nd concession north of Black River, including Gore "K" and "L" and McCan Gores, all in the Township of Hallowell; Block "I" the concessions north and east of East Lake and Gore "B" in the Township of Athol, and the 1st and 2nd concessions south of the Bay of Quinte, and Gore "A," in the Township of North Marysburg, and 1st concession south-west of Green Point, to the end of Carman's Point in Sophiasburg.

2.—The Township of South Marysburg, and the southern part of Athol, commencing at the outlet of East Lake, thence down to the head of the lake, thence down to the base line between the 1st concession south and the 1st concession north of East Lake, till it strikes the Township line of Hallowell, thence down said township line till it strikes South Marysburg.

3.—The Township of Sophiasburg, together with Big Island, excepting the 1st concession south-west of Green Point to the end of Carman's Point.

4.—All that part of the Township of Ameliasburg lying east of the line between lots Nos. 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said Township, including Huff's Island.

5.—That part of the Township of Hillier not included in the 7th Division, also the 1st and 2nd concessions north of West Lake, and west of lot No. 7 in the said concession, and that part of Irwin Gore lying north of and west of lot No. 7 in the 2nd concession, and the west part of the 2nd concession produced west of lots No. 74, in that concession, in the Township of Hallowell.

6.—Block (IV.) four, concession south side of West Lake, 1st concession "Military Tract," 2nd and 3rd concessions of said Tract west of lots No. 13 in those concessions, Gore "E," 1st and 2nd concessions north of West Lake and east of lot No. 6 in those concessions; the Gerrow Gore and that part of Irwin Gore not included in Division No. 5, and all that part of the 2nd concession produced east of lot No. 75 in the Township of Hallowell.

7.—All that part of the Township of Ameliasburg lying west of the line between lots Nos. 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said Township; all that part of the 4th and 5th concessions of the Township of Hillier west of the line between lots Nos. 86 and 87, and the 3rd concession west of the line between lots Nos. 22 and 23, with that part of the 2nd concession lying north of Pleasant Bay, in the said Township of Hillier.

8.—All the point lying east of the west line of Marsland's Gore, the concession north of Smith's Bay and Waupoos Island in the Township of North Marysburgh.

DISTRICT OF RAINY RIVER.

1.—That part of the district composed of the territory to the north of the south-easterly shore of the Lake-of-the-Woods, and a line drawn in a north-easterly direction from Rat Portage to the north end of Lake Manitou; thence in an easterly direction to the south end of the lake known as the lake where the river bends; thence in an easterly direction to a point where the said meridian of the most easterly part of Hunter's Island intersects the Canadian Pacific Railway at the south-west angle of Hawke Lake.

2.—The territory lying south and east of the Lake-of-the-Woods, and of the said line.

COUNTY OF RENFREW.

1.—Comprising the Town of Pembroke, the Townships of Pembroke, Stafford, Alice, Petewawa, Buchanan, Rolph, Wylie, McKay, Fraser, Head, Clara and Maria, and all that part of the Township of Wilberforce from the 18th to the 25th concessions, both inclusive; and also all those parts of the 14th, 15th, 16th and 17th concessions of the same Township of Wilberforce lying north of Snake River and east of Lake Dore.

2.—Comprising all that part of the Township of Westmeath lying east and north of the Muskrat Lake and River, and all those parts of the Township of Ross, from the 5th to the 9th concessions, both inclusive, east of Muskrat Lake, and from the 7th to the 13th (of the other) concessions of Ross, both inclusive, of the said township of Ross.

3.—Comprising the Village of Renfrew, and the Townships of Horton and Admasto excepting the lots numbered 1 to 22, inclusive, in the 9th, 10th, 11th and 12th concession and the whole of the concessions numbered 13, 14, 15 and 16 in said township.

4.—Comprising the Village of Arnprior and the Township of McNab.

5.—Comprising the Townships of Bagot, Blythefield, Brougham, and Matawatchan, and all the Lots numbered 1 to 22, inclusive, in the 9th, 10th, 11th and 12th concessions in the said township of Admaston and the whole of the concessions numbered 13, 14, 15 and 16 in the said township.

6.—Comprising the Townships of Grattan, Sebastopol, South Algoma, North Algoma, and all that part of the Township of Wilberforce from the 1st to the 17th concessions, both inclusive, excepting those parts of the 14th, 15th, 16th and 17th concessions of said Township of Wilberforce lying north of Snake River and east of Lake Dore.

7.—Comprising the Township of Bromley, and all that part of the Township of Westmeath west of Muskrat Lake, and all those parts of the Township of Ross from the 1st to the 4th concessions, both inclusive, east of Muskrat Lake, and from the 1st to the 6th of the other concessians, both inclusive of the said Township of Ross.

8.—Comprising the Townships of Brudenell, Radcliffe, Raglan, Lynedoch, Griffith, Hagarty, Sherwood, Jones, Richards and Burns.

COUNTY OF SIMCOE.

1.—Comprising the Town of Barrie, the Township of Vespra, except that portion lying west of the Nottawasaga River, and excepting also lots Nos. 38, 39 and 40 in the 1st and 2nd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions, respectively. That portion of the Township of Oro lying south of lots Nos. 21 in the 1st and 2nd concessions (including the Ranges), and south of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions, respectively; that porlion of the Township of Innisfil lying east of lots Nos. 5 in the 6th, 7th and 8th concessions, and that portion lying north of the 8th concession; that portion of the Township of Essa lying north of lots Nos. 19 in the 7th, 8th, 9, 10th and 11th concessions.

2.—The Village of Bradford; the Township of West Gwillimbury, excepting thereout lots Nos. 1, 2, 3, 4 and 5 in the 14th and 15th concessions; the Township of Innisfil, except that portion lying north of the 5th concession, and excepting also lots Nos. 1, 2, 3, 4 and 5 in the 1st, 2nd, 3rd, 4th and 5th concessions.

3.—The Township of Tecumseth, except concessions 12, 13, 14 and 15; the Township of Adjala, except that portion lying north of lots Nos. 25 in the 8th concession thereof.

4.—The Town of Collingwood, the Village of Stayner, that portion of the Township of Nottawasaga lying north of lots Nos. 18 in the twelve concessions thereof; that portion of the Township of Sunnidale lying north of the 8th concession; that portion of the Township of Flos lying west of the Nottawasaga River; the Islands in Lake Huron contiguous to the Township of Nottawasaga.

5.—The Township of Flos, except that portion lying west of the Nottawasaga River; the Township of Medonte, except that portion lying east of the 10th concession; and north of lots Nos. 10 in the 9th and 10th concessions, respectively; that portion of the Township of Oro, lying north of the southern boundaries of lots Nos. 21 in the 1st and 2nd concessions, and north of the southern boundaries of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions, respectively; lots 38, 39 and 40 in the 1st and 2nd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions of the Township of Vespra.

6.—The Town of Orillia, the Township of Orillia, southern division, the Township of Orillia, northern division, except that portion lying north of lots Nos. 15 in the first seven concessions thereof; that portion of the Township of Oro lying east of the 8th concession; that portion of the Township of Medonte being composed of lots Nos. 1 to 6 (both inclusive) in the 11th, 12th, 13th and 14th concessions; the Islands in Lake Simcoe contiguous to the townships and portions of townships above described lying wholly or for the most part opposite thereto.

7.—The Township of Nottawasaga, except that portion lying north of lots Nos. 18 in the 12th concession thereof; the Township of Sunnidale, except that portion lying north of the 8th concession; that portion of the Township of Vespra lying west of the Nottawasaga River; that portion of the Township of Essa lying north of lots Nos. 19 in the 1st, 2nd, 3rd, 4th, 5th and 6th concessions; that portion of the Township of Tossorontio lying north of lots Nos. 20 in each of the seven concessions thereof.

8.—The Township of Essa, except that portion lying north of lots Nos. 19 in each of the eleven concessions thereof; the Township of Tossorontio, except that portion lying north of lots Nos. 20 in each of the seven concessions thereof; that portion of the Township of Innisfil, being composed of lots Nos. 1, 2, 3, 4 and 5, in the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions; the 12th, 13th, 14th and 15th concessions of the Township of Tecumseth; lots Nos. 1, 2, 3, 4 and 5, in the 14th and 15th concessions of the Township of West Gwillimbury; that portion of the Township of Adjala lying north of lots Nos. 25 in the eight concessions thereof.

9.—The Town of Penetanguishene, and the Village of Midland, the township of Tiny; that portion of the Township of Tay lying west of the 8th concession; the Islands in Lake Huron contiguous to the Township of Tiny, and to that part of the Township of Tay, forming part of the ninth division, and lying wholly or for the most part opposite thereto.

10.—The Township of Matchedash, that portion of the Township of Orillia, northern division, lying north of lots Nos. 15 in the first seven concessions thereof; that portion of the Township of Medonte lying north of lots Nos. 6, in the 11th, 12, 13th and 14th concessions, and that portion lying north of lots Nos. 10, in the 9th and 10th concessions thereof; the Township of Tay, except that portion lying west of the 8th concession; the Island in Lake Huron, contiguous to that part of the Township of Tay, forming part of the 10th division, and lying wholly or for the most part opposite thereto.

NOTE.—Each of the said several Divisions shall include all allowances for roads embraced within its external limits, and shall also extend to the centre of every allowance for road lying external and adjacent to every such Division, excepting always where any such last-mentioned allowance is hereinbefore declared to belong to or to form part of any particular Division.

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY.

1.—Township of Charlottenburg, in the County of Glengarry.

2.—Township of Lochiel, in the County of Glengarry.

3.—Town and Township of Cornwall, in the County of Stormont.

4.—Township of Osnabruck, in the County of Stormont.

5.—Township of Williamsburg, in the County of Dundas.

6.—Township of Matilda, in the County of Dundas.

7.—Township of Mountain, in the County of Dundas.

8.—Township of Finch, in the County of Stormont.

9.—Township of Lancaster, in the County of Glengarry.

10.—Township of Winchester, in the County of Dundas.

11.—Township of Roxborough, in the County of Stormont.

12.—Township of Kenyon, in the County of Glengarry.

DISTRICT OF THUNDER BAY.

1 —All that part of the District lying west of the meridian of 87 degrees of west longitude, to the meridian of the most easterly part of Hunter's Island, excepting therefrom the Municipality of Neebing.

2.—

3.—Comprising the Municipality of Neebing.

COUNTY OF VICTORIA.

1.—The first consists of the following townships and parts of townships, viz. : of the 15th concesssion of the Township of Mariposa, and the Township of Eldon, except the ranges north and south of Portage Road.

2.—The second consists of the following townships, all of the Township of Fenelon, except that portion lying east of the Scugog River, and south of Sturgeon Lake, and the Township of Sommerville.

3.—The third consists of the Township of Verulam.

4.—The fourth consists of the Township of Emily.

5.—The fifth consists of the Town of Lindsay, Township of Ops, and that portion of the Township of Fenelon, lying east of the Scugog River, and south of Sturgeon Lake.

6.—The sixth consists of the Township of Mariposa, except the 15th concession.

7.—The seventh consists of the Townships of Carden and Dalton, Laxton, Digby and Longford, and the Township of Bexley, and that portion of the Township of Eldon north of Portage Road, and the Range south of Portage Road,

COUNTY OF WATERLOO.

1.—All that portion of the Township of Waterloo, lying north of Block line on the west side of the Grand River, and that part of the Upper block of said Township, lying on the east side of the Grand River, north of lots Nos. 115, 109, 104, 86 and 95 to the Guelph Township line, including the Towns of Berlin and Waterloo.

2.—All that part of the Township of Waterloo, lying south of the Block Line on the west of the Grand River, and that part lying on the east side of the Grand River, south of the northern boundary of lots Nos. 115, 109, 104, 86 and 95, to the Guelph Township line, including the Villages of Preston and Hespeler.

3.—All that part of the Township of North Dumfries, lying east of lot No. 19, in the 7th concession ; and running a course with the eastern boundary of the said lot in a northerly direction up to the 12th concession ; thence along the eastern boundary of lot No. 23, in the said 12th concession to the township line, including the Town of Galt.

4.—The Township of Wilmot, including the Village of New Hamburg.

5.—The Township of Wellesley.

6.—The Township of Woolwich.

7.—All that part of the Township of North Dumfries, lying west of the eastern boundary of said lot No. 18, in the 7th concession ; thence along the eastern limits of said lot No. 19, the same course thereof, in a northerly direction to the 15th concession ; thence along the westerly limit of lot No. 23, in the said 12th concession, to the township line, including the Village of Ayr.

THE COUNTY OF WELLAND.

1.—Comprising the Township of Crowland ; that part of the Township of Thorold, lying south of the line between lots 178 and 195, running through to Pelham ; that part of Pelham, lying south of the 4th concession, and that part of Humberstone, lying north of the concession line, between the 4th and 5th concession, being the whole of the 5th concession and the Town of Welland.

2.—Comprising the Township of Wainfleet.

3.—Comprising the Township of Bertie, and those parts of the Township of Humberstone not included in Nos. 1 and 6, and the Village of Fort Erie.

4.—Comprising the Township of Willoughby, the Village of Chippawa, and that part of the Township of Stamford, south of the line between lots 136 and 137 ; easterly from the western limit of the Township to the south-east angle of lot No. 133 ; thence north on the line between lots Nos. 132 and 133, to the northern boundary of the township, including the Town of Clifton and Navy Island.

5.—Comprising those parts of the Townships of Stamford, Thorold and Pelham, not included in any other Division, and the Town of Thorold.

6.—Comprising all the Township of Humberstone, lying south of the 5th concession and west of the side lines, between lots Nos. 9 and 10 in the several other concessions thereof, and the Village of Port Colborne.

COUNTY OF WELLINGTON.

1.—The Town and Township of Guelph.

2.—The Township of Puslinch.

3.—The Township of Eramosa.

4.—Consisting of the Township of Nichol, excepting the 11th and 12th concessions; the Municipality of Fergus; the first eight concessions of the Township of Garafraxa, and lots 1 to 18, both inclusive, in concessions A and B of the Township of Peel, lots 13, 14, 15, 16, 17 and 18, in concessions 18 and 19, and lots 19, 20 and 21, in the 17th concession of the Township of Peel.

5.—The Township of Erin.

6.—Consisting of the Township of Pilkington, and the 11th and 12th concessions of the Township of Nichol; the Municipality of the Village of Elora; and lots numbers 19 and upwards belonging to the 9th, 10th, 11th, 12th, 13th, 14th, 15th and 16th concessions of Peel.

7.—Consisting of concessions 1 to 16, inclusive, of the Township of Maryboro' and concessions 1 to 16, both inclusive, of the Township of Peel, except lots 19, 20, 21, 22 and 23 of those concessions in that Township.

8.—Consisting of that part of the Township of Arthur, south and south-east of lot 15, on the west side of the Owen Sound Road; lot 16 on the Owen Sound Road, and lot 12 east of the Owen Sound Road, in the Township of Arthur; that part of the Township of Luther, from lots 1 to 16, both inclusive; and lots 1 to 12, both inclusive, of the 17th and 18th concessions of the Township of Peel; lots 5 to 11, both inclusive, of the 19th concession of said Township of Peel; and lots 19 to 23, both inclusive, of concessions "A" and "B," of said Township of Peel.

9.—The territory formerly comprised in this Division is now in the County of Dufferin.

10.—Consists of the Township of Minto.

11.—Consists of the Town of Mount Forest, and that part of the Township of Arthur north of lot 16, west of the Owen Sound Road; lot 17, on the Owen Sound Road, and lot 13, east of the Owen Sound Road.

COUNTY OF WENTWORTH.

1.—All that part of the Township of Barton lying east of the line between lots 14 and 15, and all that part of Hamilton City east of Hughson Street.

2.—The whole of the Township of Flamboro' West.

3.—The whole of the Township of Flamboro' East.

4.—The whole of the Township of Beverly.

5.—The whole of the Township of Saltfleet.

6.—The whole of the Township of Ancaster.

7.—The whole of the Township of Glanford.

8.—The whole of the Township of Binbrook.

9.—All that part of the Township of Barton, lying west of the lines between lots 14 and 15, and that part of Hamilton City west of Hughson Street.

COUNTY OF YORK.

1.—The City of Toronto, east of Yonge Street, at date of 14th Sept., 1875.

2.—Concessions 5 to 11, inclusive, of the Township of Markham; and concessions 5 to 10, inclusive, of the Township of Whitchurch, from 1 to 10, inclusive, together with the Villages of Markham and Stouffville.

3.—Concessions 1 to 4, inclusive, of the Township of Markham; and concessions 1 to 4, inclusive, of the Township of Whitchurch from lot 1 to 10, inclusive; and concession 1 to 3, inclusive, of the Township of Vaughan.

4.—The Township of Whitchurch, from the line between lots 10 and 11, northward, and the Township of East Gwillimbury.

5.—The Townships of Georgina and North Gwillimbury.

6.—The Township of King and the Incorporated Village of Aurora.

7.—Concessions 1 to 11, inclusive, of the Township of Vaughan.

8.—All that portion of the Township of York lying west of Yonge street, and the Township of Etobicoke.

9.—The Township of Scarboro' and all that portion of the Township of York which lies east of Yonge Street and the Village of Leslieville.

10.—The City of Toronto, west of Yonge Street, at date of 14th Sept., 1875.

DIVISION COURT TARIFF.

Fees to be received by the several Clerks and Bailiffs of Division Courts in Ontario from and after the first day of January, 1885 :—

FORM 133.

SCHEDULE OF CLERK'S FEES.

1. Receiving claim, numbering and entering in Procedure Book ..... (This item to apply to entering in the Procedure Book a transcript of judgment from another Court, but not an entry made for the issue of a judgment summons.)	$0 15
2. Issuing summons, with necessary notices and warnings thereon, or judgment summons (as provided in the forms), in all,	
Where claim does not exceed $20	0 40
" exceeds $20, and does not exceed $60	0 50
" exceeds $60, and does not exceed $100	0 60
" exceeds $100	1 00
[*N. B.*—In replevin and interpleader suits the value of goods to regulate the fee.]	
3. Copy of summons, including all notices and warnings thereon	0 20
4. Copy of claim (including particluars), when not furnished by plaintiff (to be paid by the plaintiff)	0 20
5. Copy of set-off (including particulars), when not furnished by the defendant (to be paid by the defendant)	0 20
6. Receiving and entering bailiff's return to any summons, writ or warrant issued under the seal of the Court (except summons to witness and return to summons, or papers from another Division	0 15
7. Entering and noting every defence or notice of admission in Procedure Book. (To be paid in the first instance by the defendant or other person entering it, but it may be afterwards taxed against the plaintiff, should costs be given against him.)	0 25
8. Taking confession of judgment ..... (This does not include affidavit and oath chargeable under item 9.)	0 10
9. Every necessary affidavit, if actually prepared by the clerk, and administering oath to the deponent	0 25
10. Copies of papers for which no fee is already provided, necessarily required for service or transmission to the Judge—each.....	0 10
11. Every notice of defence of admission entered, or other notice required to be given by the Clerk to any party to a cause or proceeding, or to the Judge in respect to the same, and mailing	0 15
12. Entering final judgment by Clerk on special summons, where claim is not disputed	0 50

13. Entering every judgment rendered at the hearing or final order made by the Judge $0 50
(This one fee of 50 cents will include the service of recording at the trial and afterwards entering in the Procedure Book, the judgment, decree and order in its entirety rendered or made at the trial. In a garnishee proceeding before judgment the fee of 50 cents will be allowed for the judgment in respect to the primary debtor, and a like fee of 50 cents for the adjudication, whenever made, in respect to the garnishee.)

14. Subpœna to witness 0 15
(The subpœna may include any number of names therein, and only one original subpœna shall be taxed, except the judge otherwise orders.)

15. For every copy of subpœna required for service 0 05

16. Summons for each juryman when called by the parties 0 10
(Only 25 cents in all to be allowed for returning a Judge's jury.)

17. Every order of reference or order for adjournment made at hearing, and every order requiring the signature of the judge, and entering the same 0 25
Any warning necessary with order—*e.g.*, the warning in form 42—forms part of the order.)

18. Transcript of judgment (under section 161 or 165) 0 25

19. Every writ of execution, warrant or attachment, or warrant for arrest of delinquent, and delivering the same to bailiff 0 50

20. Renewal of every writ of execution, when ordered by the judgment creditor .. 0 15

21. Every bond, when necessary, and prepared by the Clerk (including affidavit of justification) 0 50

22. For necessary entries in the Debt Attachment Book in each case (in all) 0 20

23. Transmitting transcript of judgment, or transmitting papers for service to another Division, or to Judge on application to him, including necessary entries, but not postage 0 25

24. Receiving papers from another Division for service, entering the same, handing to the Bailiff, receiving and entering his return, and transmitting the same, (if returns made promptly, not otherwise) 0 30
(This fee does not include a charge for receiving transcript of judgment, for which a fee of 15 cents is taxable under item 1.)

25. Search by person, not party to the suit or proceeding, to be paid by the applicant, 10 cents; search by party to the suit or proceeding, where service is over one year old 0 10
(No fee is chargeable for search to a party to the suit or proceeding, if the same is not over one year old.)

26. Taxing costs in defended suits 0 25

Rule No. 175 of the Rules of practice of Division Courts.—On payment of a fee of 5 cents, every clerk, when required by parties paying costs, shall give a statement, in writing, of items in detail, or transmit the same by postal card.

FORM 134.

SCHEDULE OF BAILIFF'S FEES.

1. Service of summons, writ or warrant issued under the seal of the Court, or Judge's summons on each person (except summons to witness and summons to juryman),
   Where claim does not exceed $20 ..... $0 30
   " exceeds $20 and does not exceed $60 ..... 0 40
   " exceeds $60 and does not exceed $100 ..... 0 50
   " exceeds $100 ..... 0 75
   (In interpleader suits the value of the goods to regulate the fee.)

2. For every return as to service of summons, attending at the Clerk's office, and making the necessary affidavit (as provided by rule 90)..... 0 15

3. Service of summons on witness or juryman, or service of notice..... 0 14

4. Taking confession of judgment, or attending to prove 0 10

5. For calling parties and their witnesses at the sittings of the Court in every defended case, as provided by Rule 91, amended by Rule 168..... 0 15

6. Enforcing every writ of execution, or summons in replevin, or warrant of attachment, or warrant against the body—each,

   Where claim does not exceed $20..... 0 50
   " exceeds $20, and does not exceed $60..... 0 75
   " exceeds $60 ..... 1 00
   (Executing summons in replevin includes service on defendant. The value of the goods to regulate the amount of the fee.)

7. Every mile necessarily travelled to serve summons or process, or other necessary paper, or in going to seize on attachment, or in going to seize on a writ of execution, where money made, or case settled after that levy... 0 12

   (In no case is mileage to be allowed for a greater distance than from the Clerk's office to the place of service or seizure.)

8. Mileage to arrest delinquent under a warrant to be at 12 cents per mile, but for carrying delinqent to prison, including all expenses, and assistance, per mile..... 0 20

9. Every schedule of property seized, attached, or replevied, including affidavit of appraisal, when necessary,

   Not exceeding $20 ..... 0 30
   Exceeding $20 and not exceeding $60 .... 0 50
   Exceeding $60..... 0 75

10. Every bond, when necessary, when prepared by the Bailiff (including affidavit of justification) 0 50

11. Every notice of sale, not exceeding three, under execution or under attachment, each..... 0 15

12. There shall be allowed to the Bailiff for removing or retaining property seized under execution or attached, reasonable and necessary disbursements and allowances, to be first settled by the Clerk, subject to appeal to the judge.

13. There shall be allowed to the Bailiff five per cent. upon the amount realized from the sale of property under any execution, but such percentage not to apply to any overplus thereon.

(But if execution be satisfied in whole or in part, after seizure and before sale, the Bailiff to be entitled to charge and receive three per cent. on the amount realized.)

TENTH ANNUAL REPORT

OF THE

INSPECTOR OF LEGAL OFFICES

FOR THE YEAR

1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
PRINTED BY WARWICK & SONS, 68 & 70 FRONT STREET WEST
1893.

ANNUAL REPORT

OF THE

INSPECTOR OF LEGAL OFFICES.

To His Honour, The Honourable George Airey Kirkpatrick,
Lieutenant-Governor of the Province of Ontario.

Sir,—

In accordance with the provisions of the statute in that behalf, I have the honour to present the tenth annual report of the Inspector of Legal Offices on the inspection of the County Judicial Officers throughout the Province for the year ending the 31st December, 1892.

Since my appointment on the 1st September, 1892, I have made an inspection of the offices not examined by my predecessor during the earlier part of the year. I have also examined the bonds given by officers required to give security, and where these have been unsatisfactory for any cause, I have required new bonds to be furnished.

The following officers were appointed during the year:

Sheriffs: Joseph Jackson, Esquire, Sheriff of Norfolk, gazetted 13th August, 1892, in the room and stead of Edmund Deedes, Esquire, deceased; Frederick Sheppard O Connor, Sheriff of Bruce, gazetted 5th November, 1892, in the room and stead of William Sutton, Esquire.

Local Masters: John McSweyn, Esquire, gazetted 22nd October, 1892, to be Local Master in and for County of Victoria, *pro tempore* in consequence of the absence on leave of His Honour Judge Dean; William David Jones, Esquire, gazetted 5th November, 1892, Local Master in and for the County of Brant, *pro tempore* in the room and stead of His Honour Judge Jones, who desired to be temporarily relieved from the duties of the office.

County Crown Attorneys and Clerks of the Peace: Thomas Dalziel Cowper, Esquire, gazetted 23rd January, 1892, County Crown Attorney and Clerk of the Peace in and for the County of Welland, in the room and stead of Lorenzo Dulmage Raymond, Esquire, deceased; William J. L. McKay, Esquire, gazetted 6th August, 1892, County Crown Attorney and Clerk of the Peace in and for the County of Dufferin, in the room and stead of Elgin Myers, Esquire; James Roland Brown, Esquire, gazetted 6th August, 1892, County Crown Attorney and Clerk of the Peace in and for the County of Prince Edward, in the room and stead of Philip Low, Esquire, deceased; Hubert Hartley Dewart, Esquire, gazetted 6th August, 1892, County Crown Attorney in and for the County of York, in the room and stead of G. W. Badgerow, Esquire, deceased; Thomas Ambrose Gorham, Esquire, gazetted 29th October, 1892, Crown Attorney and Clerk of the Peace in and for the District of Thunder Bay, in the room and stead of Albert Romaine Lewis, Esquire, resigned.

Surrogate Registrar: Miss Helen McDonald, gazetted 18th June, 1892, Registrar of the Surrogate Court of the United Counties of Stormont, Dundas and Glengarry, in the room and stead of Alexander E. McDonald, Esquire, deceased.

Sheriffs' Offices.

The duties of these officers have, on the whole, been performed very satisfactorily during the past year. The most serious omission on the part of many of the sheriffs which I have observed during my inspection is in their neglect in seeing that the jury panels drafted by them are at once entered and certified in the juror's book. This neglect I found to be too general. In some cases the juror's book contained a list of the names drafted without the certificate, and in one case in a most important county I found that no entry whatever of the panels had been made in the books. I have drawn the attention of the sheriffs to the importance of a strict compliance with the Act in this regard. Where the Act is not complied with the Clerks of the Peace are not blameless for the omission. The Juror's Act, R. S. O. Cap. 52, sec. 92, prescribes the manner of drafting the panels, and in sub-sec. 6 enacts: "The panel so alphabetically arranged and numbered with a short statement of the writ or precept in obedience to which it has been drafted, the date and place of such drafting, and the names of the sheriff or other officer, or his deputy, and of the clerk of the peace and justices of the peace present at such drafting, or of at least two of them, shall then be fairly entered in the said juror's book, and attested by the signatures of such sheriff, or his deputy, or other officer, and of the said clerk of the peace and the said justices, or at least two of them." In the absence of the proper entry and certificates in the juror's books, the regularity of the panels may be open to serious question.

Moneys collected by the sheriffs have been promptly paid over. No intentional overcharges have been made; nor any, except of very trifling amounts. The books of office were generally well kept and entries promptly and properly made. In a few cases I have been appealed to to settle questions of fees between the sheriffs and solicitors, and have been able in such instances to prevent the expense of applications to the court.

The grievances mentioned in the inspector's report for 1891 in respect of interpleader costs, and of executions against worthless debtors, have not been remedied. The present state of the law is not satisfactory, or quite fair to the officers who, in cases of the kind complained of, are required by their duty to incur outlay and expenses which are never repaid.

I have set forth in Appendix "A" in tabulated form statistical returns made by all the sheriffs for the year ending 31st December, 1892.

Local Masters.

The duties of these officers have been performed during the past year without complaint of any kind. In my visits I was in some cases unable to examine fully the proceedings owing to the absence of the local masters. I had occasion only in one instance to draw attention to delay in making report.

Statistical returns of the business done by the local masters for the year 1892 are set out in Appendix "B."

Local Registrars, Deputy Registrars, Deputy Clerks of the Crown and County Court Clerks.

I have found the work of these officers particularly well performed, and regularity and general uniformity of practice to prevail in all counties. I have had considerable correspondence with these officers on questions of practice arising before them. By such correspondence, much of which was carried on in former years between the officers and the inspector, and by my annual visits to the officers, I trust soon to see a very complete uniformity of procedure prevail in all the offices of the courts.

I have only found in a few cases the omission of stamps on the proceedings, and in those of only small amounts, and evidently arising from oversight which could hardly be regarded as culpable.

In appendices "C" and "D" I have set out the statistical returns of business done by these officers during the year 1892.

Surrogate Registrars.

I have found the duties of these officers to be well performed; the stamps have been carefully and correctly cancelled, and the books and records neatly kept.

In some cases I found a fee for the judge of $1, for a special attendance, had been charged in every case on the order for probate or letters of administration where only a fee of 50c. should be charged. The attention of the judges having been drawn to it, I trust the practice may be discontinued.

In Appendix "E" is set forth the statistical returns of business done by these officers for the year ending 31st December, 1893.

County Attorneys and Clerks of the Peace.

These officers I have found to have conducted the business and kept the records of their offices generally in a very satisfactory manner. The observations I have made respecting the drafting and certifying of jury panels will not be lost sight of by the clerks of the peace, whose duty it is to be present at the drafting of the panels. I have not this year had any complaint, as was too frequently the case formerly, of the neglect of county attorneys, as law stamp distributors to keep a sufficiency of stamps on hand for the use of the profession in their counties. The allowances and disallowances made by the various boards of audit throughout the Province are still quite different, but in all cases where I have been able to make any recommendation, my suggestions have, I believe, been adopted, and in time I hope a more uniform practice may prevail.

General Remarks.

Before the end of the year I sent out to each of the officers who are required to make annual returns to me, blank forms of such returns to be filled up by them; in many cases these returns have not been promptly made and I have been obliged, in consequence, to have a great deal of correspondence which ought to have been unnecessary. I have had to write in some cases several times without getting an answer. Next year I shall hope to see each officer do his duty in this respect without unnecessarily imposing trouble and delay on others.

I have the honour to be, Sir,

Your most obedient servant,

JAS. FLEMING,

Osgoode Hall, Toronto, 25th April, 1893. Inspector.

APPENDICES.

APPENDIX A.—Containing in Tabulated Form Statistics as returned by the

Counties or Districts.	Number of Services of Writs of—						Miscellaneous Process Served.	
	Summons.		Subpœna.		*Ca Re & Ca Sa.*			
	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.
Algoma	10	9	1	4		2	5	5
Brant	32	27	13	12	1		6	
Bruce	31	18	18	21			13	5
Carleton	147	65	53	41		1	85	34
Dufferin	32	15	2	2			3	2
Elgin	39	21	7	1			25	4
Essex	55	33	63	57	3	2	8	1
Frontenac	45	16	1	1			2	1
Grey	42	17	15	17	1	3	5	1
Haldimand	9	6	9	46			14	6
Halton	18	8	2	1			4	1
Hastings	63	28	36	24	1	1	26	3
Huron	44	28	8	7	3	2	21	1
Kent	36	55	43	24	3	1	14	14
Lambton	22	29	16	25	2	2	15	5
Lanark	25	5	1	8			7	4
Leeds and Grenville	46	21	8	8			11	4
Lennox and Addington	27	2	4	1			8	
Lincoln	39	24	15	23			18	2
Middlesex	38	22	20	66	1	1	10	8
Muskoka	18	22	16	73				20
Norfolk	29	10					10	
Northumberland and Durham	25	18	35	21			12	4
Ontario	40	19	16	14			22	3
Oxford	74	41	69	91	4	1	24	6
Parry Sound	8	8		23			3	2
Peel	38	9	15	10	2		15	3
Perth	33	17	10	13			17	7
Peterborough	33	22	10				12	6
Prescott and Russell	46	20	14	7		1	10	1
Prince Edward	20	10	10	2			4	4
Rainy River	7	8	1	9			10	5
Renfrew	30	16	11				2	1
Simcoe	61	29	13	28	4	2	19	9
Stormont, Dundas and Glengarry	42	30	3			2	3	1
Toronto	717	226	123	16	4	5	329	55
Thunder Bay	16	18	3	5			16	13
Victoria	35	29	4	3			16	9
Waterloo	30	20	6	5	7	1	19	1
Welland	36	19	17	13			12	
Wellington	35	13	16	31	1	2	8	4
Wentworth	88	24	9	2	1	2	24	2
York	117	48	14	232		2	47	5
Totals	2378	1125	750	987	38	33	934	262

different Sheriffs for the year ending 31st December, 1892.

Total number of services.	Number of estreats received.		Number of Writs of Execution.				Number of Writs of Renewal Received.			
			(1) Against goods.		(2) Against lands.		(1) Against goods.		(2) Against lands.	
	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.
36	.....	.....	32	33	26	30	11	22	27	41
91	.....	.....	20	38	13	31	6	12	11	22
106	.....	.....	47	51	35	50	6	6	22	46
426	7	.....	70	75	60	52	26	17	33	25
56	.....	.....	31	32	19	32	4	18	8	30
97	.....	.....	27	41	27	35	15	6	19	20
222	.....	.....	45	84	34	74	2	7	12	25
66	.....	.....	42	37	29	31	16	22	16	18
101	.....	.....	50	53	26	54	7	18	21	50
90	.....	.....	12	19	10	17	.....	1	.....	1
34	.....	.....	17	26	12	16	6	13	11	20
182	.....	.....	45	61	37	46	52	47	58	69
114	.....	.....	41	53	33	48	9	41	18	63
190	.....	1	35	77	26	74	18	29	35	60
116	.....	.....	39	72	30	67	31	47	38	95
50	.....	.....	16	24	11	20	1	7	2	11
98	.....	.....	38	42	27	39	3	20	6	28
42	.....	.....	8	11	5	7	6	12	9	16
121	.....	.....	27	50	23	37	19	16	19	21
166	.....	.....	55	77	41	72	12	20	23	42
149	.....	.....	10	21	14	21	9	5	2	5
49	.....	.....	15	33	10	37	5	5	5	22
115	.....	.....	36	68	24	67	36	49	38	73
114	.....	.....	31	45	27	34	5	12	15	34
310	.....	.....	30	36	19	32	11	18	12	23
44	.....	.....	22	20	19	21	10	4	12	9
92	.....	.....	26	26	24	25	4	3	8	11
97	.....	.....	29	33	20	29	15	29	15	31
83	.....	.....	20	42	13	31	3	14	5	22
99	.....	.....	12	21	11	22	4	14	14	34
50	.....	.....	23	18	14	17	4	6	3	7
40	.....	.....	5	6	3	4	.....	2	1	4
60	.....	.....	15	37	15	39	8	11	8	14
165	.....	.....	71	80	41	73	9	14	55	90
81	.....	.....	39	68	27	61	22	39	23	64
1475	.....	.....	654	447	438	400	59	51	227	288
71	.....	.....	19	25	16	26	8	31	16	32
96	.....	.....	32	41	23	37	13	26	16	39
89	.....	.....	25	35	10	25	3	.....	6	19
97	.....	.....	27	36	20	33	14	18	20	25
110	.....	.....	49	37	32	36	10	18	23	40
152	.....	.....	48	53	41	43	35	35	54	55
465	.....	3	134	132	116	115	8	7	116	126
6507	7	4	2069	2316	1501	2060	545	792	1082	1770

APPENDIX A.—Containing in Tabulated Form Statistics as returned by the

Counties or Districts.	Number of Sales under Writs of Execution.				Number of cases entered under Creditors' Relief Act.	Number of Certificates received under this Act.	Assignments to Sheriffs under R. S. O., 1887, Cap. 124.
	(1) Against goods.		(2) Against lands.				
	H.C.J.	C. C.	H.C.J.	C. C.			
Algoma	3	1	.....	2	2	.....	.....
Brant	2	3	.....	.....	3	4	.....
Bruce	8	15	.....	.....	3	15	1
Carleton	1	1	1	.....	3	1	.....
Dufferin	4	.....	1	.....	5	6	2
Elgin	2	2	.....	2	6	5	.....
Essex	3	.....	.....	6	4	8	4
Frontenac	2	.....	.....	1	1	7	.....
Grey	5	.....	.....	1	2	.....	.....
Haldimand	.....	2	.....	.....	2	1	2
Halton	3	.....	.....	2	1	7	.....
Hastings	6	2	1	.....	6	9	5
Huron	1	.....	.....	.....	1	.....	4
Kent	6	6	.....	3	8	8	.....
Lambton	3	.....	1	1	5	13	1
Lanark	.....	1	.....	.....	.....	.....	.....
Leeds and Grenville	4	3	1	1	8	9	5
Lennox and Addington	.....	1	.....	.....	1	.....	.....
Lincoln	.....	4	.....	.....	4	.....	5
Middlesex	3	.....	1	1	5	7	.....
Muskoka	.....	2	1	.....	1	3	.....
Norfolk	1	.....	.....	1	2	8	.....
Northumberland and Durham	6	2	1	1	6	3	.....
Ontario	2	1	1	.....	4	10	1
Oxford	4	2	1	.....	9	18	1
Parry Sound	1	2	.....	1	2	1	.....
Peel	2	2	.....	.....	4	6	.....
Perth	3	1	.....	.....	8	.....	4
Peterborough	2	.....	1	.....	3	.....	.....
Prescott and Russell	2	2	.....	2	6	5	1
Prince Edward	5	2	.....	1	7	28	1
Rainy River	1	.....	.....	.....	.....	.....	1
Renfrew	1	4	.....	1	1	.....	.....
Simcoe	3	2	2	.....	5	4	1
Stormont, Dundas and Glengarry	3	5	.....	.....	6	3	11
Toronto	16	1	1	1	14	1	.....
Thunder Bay	.....	.....	.....	1	1	.....	2
Victoria	.....	1	.....	.....	.....	.....	.....
Waterloo	3	2	.....	2	8	10	3
Welland	6	2	2	.....	10	3	.....
Wellington	2	3	.....	.....	2	1	.....
Wentworth	1	.....	.....	4	.....	.....	1
York	.....	4	2	3	9	4	.....
Totals	120	93	18	38	.....	208	56

different Sheriffs for the year ending 31st December, 1892.—*Continued.*

Amount Endorsed on Writs of Execution Against Goods (not Renewals).				Amount Realized by Actual Sales under Writs of Execution.			
(1) For Debt or Damages.		(2) For Solicitors' Costs Taxed.		(1) Against goods.		(2) Against lands.	
H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
41142 84	15051 45	2128 02	1976 87	799 79	263 89	75 65	45 78
8006 61	5010 18	1262 52	489 97	801 53	205 42	.....	.....
32835 82	8666 94	1347 36	558 22	840 11	369 96	.....	.....
783788 93	13146 72	2270 33	848 79	91 00	69 00	800 00	.....
36410 50	4902 77	1201 96	371 50	1473 12	.....	300 00	.....
14674 51	5722 35	2811 40	665 02	187 36	47 50	.....	97 00
49492 51	13486 31	2089 14	1387 02	2181 00	.....	.....	684 35
54872 94	7104 07	1309 70	669 09	1239 97	.....	.....	10 00
35731 53	7847 91	1278 76	531 19	551 90	.....	.....	30 00
16657 82	2533 38	446 66	247 16	.....	168 00	.....	.....
28214 31	4984 84	1132 18	344 85	1642 99	.....	.....	30 00
35005 63	14615 18	2493 91	1245 52	3316 91	469 75	101 00	.....
166161 40	9579 64	3331 18	1087 09	150 00	.....	.....	.....
74042 49	13157 74	3673 69	1827 87	886 58	1424 02	.....	336 24
87642 51	10345 37	2257 81	978 30	1263 99	90 78	2001 16	282 38
14447 14	3675 48	1902 09	366 96	.....	80 00	.....	.....
57645 97	6434 89	3089 25	1058 32	280 70	547 63	20 00	15 00
7449 42	1575 05	183 69	249 70	.....	533 25	.....	.....
31713 86	7081 74	1459 88	465 11	469 30	568 00	.....	.....
133786 65	14348 76	1484 04	990 65	6569 49	.....	912 10	26 00
4850 82	3221 29	439 58	195 00	.....	258 50	50 00	50 00
6444 40	5058 56	202 89	655 54	50 45	110 21	.....	128 30
25371 25	12047 00	1905 28	1341 36	676 93	344 16	753 75	74 02
46566 99	8537 69	1097 09	648 15	842 94	160 00	35 00	.....
22245 94	8861 59	1653 43	725 17	678 41	474 15	600 00	.....
23101 63	4378 02	446 38	362 25	2201 69	290 07	.....	155 00
59191 63	4912 70	1650 47	858 48	493 78	210 00	.....	.....
33905 31	5128 48	2555 73	739 02	699 20	310 64	.....	.....
25533 40	6220 61	1369 53	710 15	565 53	.....	165 00	.....
10704 14	4499 07	445 65	333 62	312 70	470 35	.....	255 00
17415 09	2887 38	1012 61	300 59	2889 32	577 40	.....	135 00
28869 74	4560 56	70 04	327 72	450 00	.....	.....	.....
16062 51	6171 62	689 08	595 82	501 00	373 65	.....	75 00
95872 43	10744 67	2472 64	979 21	1395 87	458 87	85 00	1 00
26763 60	10183 24	1141 52	976 64	1133 40	607 80	.....	.....
501783 48	372557 37	10510 84	6643 21	5315 88	147 00	2500 00	10 00
27951 73	4530 34	923 46	891 31	.....	.....	.....	45 00
21537 63	7548 66	1829 77	695 70	.....	195 70	.....	.....
36333 45	5550 98	765 63	365 50	373 40	233 00	.....	1100 00
32653 60	5908 54	1192 99	551 05	473 75	373 00	900 00	.....
24610 42	6819 41	3481 35	414 20	186 25	305 50	.....	.....
58602 18	8008 06	3077 04	1016 73	890 30	.....	.....	34 30
277150 77	27186 59	3789 68	1803 15	.....	631 34	181 00	350 00
3133245 53	704793 20	79876 25	38488 77	42876 54	11368 55	9479 66	3969 37

APPENDIX A.—Containing in Tabulated Form Statistics as Returned by the

Counties or Districts.	Amount Received for Fines, Penalties, etc.		Amount Received under Writs of *Ca Re* and *Ca Sa*.		Amount Realized under Writs of Execution without actual sale.	
	H.C.J.	C. C.	H.C.J.	C. C.	H.C.J.	C. C.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Algoma					1514 96	1848 80
Brant					1071 95	916 43
Bruce					178 21	861 71
Carleton					4080 78	1393 17
Dufferin					605 75	1639 81
Elgin					619 60	1431 99
Essex			2027 17	476 29	4590 07	2131 49
Frontenac					67 79	
Grey					951 92	341 94
Haldimand	100 00					68 59
Halton						2161 87
Hastings					1218 18	939 50
Huron					2956 54	2215 45
Kent		250 00			1386 26	1540 17
Lambton					1141 55	1283 24
Lanark					240 67	918 36
Leeds and Grenville					2040 27	931 23
Lennox and Addington					359 85	917 90
Lincoln						837 57
Middlesex					247 79	2010 89
Muskoka						505 31
Norfolk					1258 20	1216 46
Northumberland and Durham					452 18	887 75
Ontario					1192 60	920 40
Oxford					1532 94	1226 74
Parry Sound					114 29	406 05
Peel					678 80	644 61
Perth					1289 29	1579 57
Peterborough						163 50
Prescott and Russell					362 54	2560 81
Prince Edward						205 87
Rainy River						
Renfrew		45 80			2810 63	1261 66
Simcoe					6374 57	921 12
Stormont, Dundas and Glengarry				496 75	2126 25	1939 63
Toronto					14286 51	
Thunder Bay					310 08	1213 78
Victoria					824 89	79 31
Waterloo			113 37		1105 86	468 54
Welland					1233 68	1074 94
Wellington				386 00	1420 93	1301 73
Wentworth					904 80	989 75
York		145 00		114 27	992 37	2171 90
Totals	100 00	440 80	2140 54	1473 31	62543 55	46129 54

different Sheriffs for the year ending 31st December, 1892.—*Concluded.*

Amount of Fees earned for the Administration of Justice payable by the Province.	Amount of Fees so earned payable by the County.	Amount of Fees otherwise earned.	Amount paid by the Province as salary.	Total amount of fees and salary earned.	Remarks.
$ c.	$ c.	$ c.	$ c.	$ c.	
996 48	.....	961 05	1000 00	2957 53	
1174 89	502 61	991 62	.....	2669 12	
106 71	24 18	241 13	.....	372 02	Fees from 9th November only.
1415 50	597 98	3310 05	.....	5323 53	
581 47	507 65	1240 53	.....	2329 65	
1183 22	394 90	1135 44	.....	2713 56	
883 90	536 80	2530 36	.....	3951 06	
921 88	311 05	399 62	100 00	1732 55	
626 70	962 35	1722 47	.....	3311 52	
1225 91	378 51	501 10	100 00	2205 52	
682 12	344 87	495 80	.....	1522 79	
1434 10	627 54	2672 26	.....	4733 90	
636 10	454 36	2030 75	.....	3121 21	
1128 50	685 48	1779 99	.....	3593 97	
978 60	476 46	1397 29	.....	2852 35	
598 01	407 37	522 16	.....	1527 54	
880 85	705 30	1583 65	.....	3169 80	
514 36	346 37	557 04	.....	1417 77	
1196 85	221 53	809 98	.....	2228 36	
1621 30	1259 99	1491 98	.....	4373 27	
1017 65	.....	386 33	500 00	1903 98	
501 57	500 50	764 04	.....	1766 11	
1079 05	647 60	1653 32	.....	3379 97	
743 16	554 90	1163 72	.....	2461 78	
1026 15	536 82	1469 11	.....	3032 08	
802 27	....	341 67	500 00	1643 94	
1000 53	388 96	1237 46	.....	2626 95	
669 10	444 15	1373 55	.....	2486 80	
957 12	510 86	779 19	....	2247 17	
450 47	431 67	1092 61	500 00	2474 75	
643 49	401 54	380 26	200 00	1625 29	
566 00	.....	247 61	1000 00	1813 61	
675 72	531 25	1273 37	.....	2480 34	
1337 96	705 22	2314 33	.....	4357 51	
801 68	920 17	1346 21	.....	3068 06	
682 52	3393 51	13490 07	.....	17566 10	
691 79	.....	772 04	1200 00	2663 83	
710 80	613 46	1013 88	.....	2337 64	
1009 83	435 77	1012 90	100 00	2608 50	
569 00	642 96	1182 83	....	2394 79	
967 10	386 32	1492 02	....	2845 44	
3191 85	550 69	1850 58	.. ..	5593 12	
4133 40	648 69	4336 20	.....	9118 29	
43015 16	23040 34	67347 57	5200 00	138603 07	

APPENDIX B.—Being a Return of Business transacted by Local Masters throughout the

Counties or Districts.	Number of orders made for the following purposes.					Number of examinations taken as special examiners or otherwise before trial.
	(1) For the administration of estates.	(2) For the partition or sale of property.	(3) Relation to infants under R. S. O., chap. 40, s. 76 (Examination only).	(4) Under the Winding-up Acts.	(5) Other Orders made in Chambers.	
Algoma					3	
Brant	1	8				
Bruce					8	10
Carleton		3			127	9
Dufferin	2				6	2
Elgin	5	2				31
Essex		1				24
Frontenac		1				11
Grey		1			1	1
Haldimand						2
Halton						
Hastings	3				91	25
Huron						
Kent		2			21	28
Lambton		2		3	3	2
Lanark	1					2
Leeds and Grenville	2	1			32	2
Lennox and Addington					18	1
Lincoln	1	2			2	5
Middlesex		5		3		38
Muskoka and Parry Sound						
Norfolk					2	14
Northumberland and Durham	1	2			35	2
Ontario					8	2
Oxford	1	2				
Peel						
Perth	2	1				11
Peterborough	2	4			58	3
Prince Edward					1	10
Prescott and Russell	1					
Renfrew		4			10	
Simcoe	1	1			47	31
Stormont, Dundas and Glengarry	5	4			67	2
Thunder Bay						
Victoria						
Waterloo	6	1	1	1	12	
Welland						
Wellington	4				62	47
Wentworth	2	5			47	3
Totals	40	52	1	7	661	318

Province of Ontario, other than Toronto, during the year ending 31st December, 1892.

Number of Judgments or Orders brought into the Masters Office for taking the following accounts, etc.

Administration of estates.	Executors, trustees or committees' accounts and compensation.	Foreclosure of mortgage or bond.	Redemption of mortgage or bond.	Sale under mortgage or agreement.	Account on any charge or lein on land, other than Mechanics' Lien Act.	Account under Mechanics' Lien Act.	Specific performance.	Partnership accounts.	Alimony.	Partition or sale.	Damages for breach of contract or covenant.	Work and labor done.	Money received, paid, advanced or lent.	Goods sold and delivered.
.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	1	1	1	.....	.....	.....	2	.....	4	.....	.....	.....	.....
4	1	.....	1	1	2	1	.....	.....	.....	.....	1	.....	.....	.....
1	.....	19	.....	10	.....	.....	.....	.....	.....	3	.....	.....	1	.....
.....	.....	3	2	1	.....	.....	.....	.....	.....	2	1	.....	.....	.....
2	.....	3	.....	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....
1	2	2	.....	.....	.....	6	.....	.....	.....	4	2	.....	.....	.....
.....	1	13	.....	12	.....	2	.....	.....	.....	1	.....	.....	.....	.....
1	.....	1	.....	2	.....	.....	.....	.....	1	.....	1	.....	.....	.....
1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	2	.....
4	.....	3	.....	9	.....	1	.....	.....	1	1	.....	1	.....	1
1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	2	.....	.....	1	.....	.....	.....	4	.....	1	.....	.....
.....	1	.....	.....	.....	.....	2	.....	2	2	.....	.....	.....	.....	.....
1	.....	4	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	1	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....
2	.....	1.	3	1	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
3	3	1	1	2	4	2	.....	2	.....	5	2	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
1	1	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	2	.....	1	.....	2	.....	.....	.....	.....
4	1	.....	.....	2	.....	1	.....	1	.....	5	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	4	1	1	1	2	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	1	.....	3	.....	.....	.....	.....	.....	1	1	.....	.....	.....
.....	.....	5	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3
8	.....	11	.....	7	.....	.....	.....	1	.....	2	.....	.....	.....	.....
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	7	5	6	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....
3	.....	3	.....	1	.....	.....	.....	.....	.....	4	.....	.....	.....	.....
4	1	.....	.....	3	.....	.....	.....	.....	.....	2	.....	.....	.....	1
5	.....	2	1	1	4	2	.....	3	.....	1	.....	.....	3	.....
66	25	98	19	69	14	27	.....	12	6	46	8	2	8	5

APPENDIX B.—Being a Return of Business transacted by Local

Counties or Districts.	Number of judgments or orders etc.—*Continued.*						Number of advertisements of sale issued.	Number of reports issued.
	Promissory notes, bills of exchange.	Bonds, life and fire insurance.	Infants' estates.	Quieting Title matters.	Lunacy.	Miscellaneous.		
Algoma								3
Brant							6	7
Bruce						1	4	8
Carleton				2		1	28	49
Dufferin								11
Elgin						3	5	18
Essex		1		2		1	10	21
Frontenac				1		1	5	28
Grey							3	6
Haldimand								5
Halton								5
Hastings		1				4	4	25
Huron							2	11
Kent							4	7
Lambton							3	4
Lanark							8	14
Leeds and Grenville							8	12
Lennox and Addington						1	1	5
Lincoln						3	11	29
Middlesex			3				9	
Muskoka and Parry Sound								
Norfolk								1
Northumberland and Durham				1			7	10
Ontario					2	1	1	8
Oxford							6	16
Peel								
Perth				1			6	23
Peterborough							4	11
Prince Edward							2	5
Prescott and Russell							3	5
Renfrew							2	8
Simcoe				2	1		7	19
Stormont, Dundas and Glengarry							9	17
Thunder Bay								6
Victoria								
Waterloo							6	20
Welland						1	2	16
Wellington				1	3	2	8	19
Wentworth			1	1		1	8	34
Totals		2	4	11	6	20	82	486

Masters throughout the Province of Ontario, etc.—*Concluded.*

Number of references pending at date of return	Number of bills of costs taxed by Master.	Amount realized by sales held under the direction of Master.	Amount of costs of reference, etc., taxed by Master or under his direction.	Amount of commission allowed in administration and partition matters.	Amount of fees earned by Local Masters.	Remarks.
		$ c.	$ c.	$ c.	$ c.	
.....	3	.....	.....	.....	56 15	Since 1st July only.
4	6	14790 00	423 14	405 00	177 90	
7	11	5000 00	974 62	693 00	360 10	
11	34	90308 52	3493 65	1477 87	2260 48	
9	7	.....	414 58	328 36	177 24	
7	36	18020 25	3719 90	880 88	1357 48	
10	22	4788 50	1679 66	717 35	912 45	
7	24	7760 00	2323 21	126 50	632 18	
5	13	7500 00	1959 75	328 30	174 20	
2	3	.....	400 00	370 00	82 10	
2	4	.....	393 13	355 00	89 10	
13	34	12650 00	4557 06	435 06	1270 30	
2	9	3650 00	397 53	834 42	246 90	
4	27	4699 00	1462 00	450 00	800 00	
2	3	17625 00	.....	85 00	218 22	
8	12	8820 85	1033 17	117 65	270 00	
5	4	31550 00	439 60	1424 75	320 40	
.....	3	25065 00	513 94	688 00	241 30	
5	25	35170 00	4072 94	557 40	1008 58	
10	13	10204 11	2265 17	131 80	1318 18	
.....	.....	.....	.....	.....	.....	No business.
.....	.....	.....	.....	.....	171 40	
5	11	3835 00	1506 91	252 25	513 66	
.	.....	300 60	241 49	.....	336 90	
8	.....	24623 00	524 79	1336 90	349 61	
.....	.....	.....	.....	.....	.....	
6	40	7660 00	3800 91	2572 99	1408 08	
.....	4	4958 25	219 38	417 56	305 80	
6	5	2000 00	593 58	.....	390 14	
2	.....	1300 00	151 31	110 00	56 40	
2	8	4535 33	728 20	180 30	114 10	
5	28	20140 00	6514 94	1474 73	764 40	
31	33	9967 50	2163 26	519 00	644 30	
.....	2	....	98 26	.....	398 90	
.....	.....	....	.....	....	....	
6	16	9959 00	1587 00	564 00	315 00	
1	12	....	1390 06	.....	221 53	
6	14	15955 00	1105 63	992 00	1249 22	
21	25	42535 96	2663 75	582 60	771 73	
212	491	439770 27	53812 52	19408 67	19984 43	

APPENDIX C.—Being a Return of all Business Transacted by Local Registrars, Deputy during the year ending

Counties or Districts.	Number of Writs Issued in the		Number of Writs *Ca Re* or *Ca Sa* Issued.		Total Amount Endorsed on such Writs.		Number of Actions Entered in Procedure Book.	
	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.
					$ c.	$ c.		
Algoma	12	5	.....	.....	12504 42	1739 50	12	6
Brant	65	31	.....	.....	29827 65	20104 90	54	20
Bruce	54	27	.....	.....	46677 60	23947 18	41	23
Carleton	194	97	.....	.....	399784 01	122221 32	151	76
Dufferin	42	20	.....	.....	33245 88	9437 28	30	17
Elgin	101	50	3	.....	.....	.....	73	41
Essex	103	50	.....	.....	77595 54	23794 81	75	58
Frontenac	138	55	.....	.....	175860 33	70185 79	93	46
Grey	62	30	2	1	66940 92	29691 16	51	22
Haldimand	18	8	.....	.....	14476 84	4108 60	13	8
Halton	16	8	.....	.....	17925 35	5823 99	13	8
Hastings	137	69	.....	.....	146833 25	69639 48	112	69
Huron	68	35	1	.....	74479 50	28940 70	46	16
Kent	58	37	.....	.....	.....	28823 44	60	37
Lambton	53	26	.....	.....	.....	.....	53	23
Lanark	72	37	.....	.....	63476 00	20759 00	45	18
Leeds and Grenville	49	31	.....	.....	36971 68	21879 79	45	9
Lennox and Addington	34	17	.....	.....	21987 35	15775 55	27	13
Lincoln	57	29	.....	.....	30709 32	34580 00	42	29
Middlesex	257	128	2	.....	218264 83	122154 38	177	165
Muskoka	5	2	.....	.....	7901 95	963 05	3	1
Norfolk	18	9	.....	.....	3980 76	4157 50	14	7
Northumberland and Durham	74	37	.....	.....	94300 57	26687 17	28	13
Ontario	54	27	.....	.....	68833 07	24155 64	38	16
Oxford	62	30	2	.....	62788 62	43659 77	48	30
Parry Sound	4	1	.....	.....	4735 69	512 82	2	.....
Peel	27	14	.....	.....	26110 82	11177 49	18	12
Perth	69	35	.....	.....	37630 39	2 901 51	54	28
Peterborough	74	37	.....	.....	82483 38	31957 61	54	30
Prescott and Russell	16	9	.....	.....	20512 65	14874 82	15	7
Prince Edward	34	16	.....	.....	43315 46	15801 48	27	10
Renfrew	45	22	.....	.....	14896 83	6685 44	30	15
Simcoe	121	61	.....	.....	90324 43	55216 17	104	50
Stormont, Dundas and Glengarry	106	53	.....	.....	98317 21	61365 83	76	47
Thunder Bay	26	14	.....	.....	37095 03	38300 95	26	12
Victoria	42	21	.....	.....	33016 20	15524 75	38	15
Waterloo	67	33	.....	.....	77804 48	16897 56	45	22
Welland	28	13	.....	.....	39581 11	6695 83	22	12
Wellington	80	39	.....	.....	59271 11	42470 75	60	28
Wentworth	264	132	3	.....	289312 67	239185 68	215	99
York	2097	1048	.....	.....	.....	.....	1251	604
Totals	4903	2443	13	1	2659772 90	1335598 09	3381	1762

Registrars and Deputy Clerks of the Crown throughout the Province of Ontario, 31st December, 1892.

Number of *Lis pendens* Issued.		Number of *Præcipe* Orders Issued.		Number of Orders Issued and Signed by Local Judge		Number of Examination of Parties.		Number of Actions Entered for trial.				Number of Judgments Entered without Trial.	
								(1) By Jury.		(2) Without Jury.			
Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.
1	.....	2	4	16	6	1	.....	1	1	1	1	4	4
4	3	25	22	18	15	15	21	11	8	7	3	14	6
1	3	21	5	29	8	27	10	12	2	5	6	16	6
1	3	58	71	73	8	33	.....	25	.....	37	4	75	40
9	1	26	8	29	8	17	11	5	5	4	2	9	3
7	4	31	13	28	10	13	13	8	5	15	8	18	7
3	5	45	34	17	16	45	19	16	10	24	13	23	13
10	2	21	14	71	40	21	7	5	1	8	10	50	25
7	4	23	11	10	7	10	7	9	2	5	2	10	6
2	.....	12	4	4	1	9	1	5	1	3	.....	3	2
3	1	3	.....	4	1	1	.....	2	.....	1	.....	4	4
7	6	75	68	22	6	30	4	17	8	15	12	37	19
7	3	22	5	28	....	14	2	11	.....	3	4	9	4
10	.....	26	30	14	....	23	24	9	3	9	9	13	8
5	3	24	10	15	6	13	11	10	5	6	1	16	7
2	1	14	2	35	21	10	.....	2	.....	4	.....	22	10
..	....	3	5	6	9	.....	18	2	9	.....	3	3	15
7	2	4	8	4	3	7	8	2	2	2	5	7	3
1	1	35	13	34	18	29	.....	9	.....	9	10	23	10
23	13	96	44	86	14	53	.....	25	16	19	15	75	30
.....	.....	.....	.....	3	.....	1	.....	3	.....	.....	1	.....	.....
2	.....	12	3	7	3	8	4	5	1	3	.....	3	6
3	1	25	9	19	5	25	11	9	6	7	2	27	16
2	1	15	8	19	3	11	2	6	6	5	2	17	3
9	5	38	16	26	7	28	9	13	8	1	9	8	8
1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1
.....	1	11	2	15	4	14	2	4	1	4	1	9	9
11	4	46	24	53	21	44	20	15	6	12	7	16	9
2	1	36	18	1	.....	18	9	12	8	6	2	11	6
2	.....	6	2	7	5	7	6	2	..	1	1	5	3
1	3	16	8	20	6	6	1	3	2	2	1	16	2
.....	.....	5	4	18	9	2	3	3	.....	3	2	15	4
12	6	51	29	14	47	48	31	21	7	5	18	36	10
6	2	16	33	48	38	16	17	7	2	6	4	39	21
5	1	15	7	38	14	8	1	1	.....	4	2	11	2
3	.....	10	5	3	2	25	10	9	3	9	2	13	10
6	1	34	11	7	7	26	24	9	6	10	8	14	6
6	2	14	8	13	10	13	10	3	3	5	3	6	6
5	4	15	19	12	2	13	14	12	5	3	6	15	10
26	14	77	41	118	67	45	34	20	14	21	9	89	46
175	96	770	400	.....	.....	.....	.....	137	57	114	56	.....	.....
287	200	1780	1019	987	438	747	348	488	204	401	234	794	394

APPENDIX C.—Being a Return of all Business Transacted by Local Registrars, Deputy during the year ending

Counties or Districts.	Total Amount of such Judgments without Costs.		Total Amount of Costs Taxed thereunder.		Total Amount of Disbursements allowed thereunder.	
	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Algoma	2256 99	2374 10	324 25	250 56	88 56	61 31
Brant	11303 96	3084 98	436 29	223 24	128 04	43 14
Bruce	16329 21	6509 90	468 83	218 20	129 48	65 17
Carleton	107961 44	50394 02	1694 32	952 26	585 41	352 20
Dufferin	3796 34	1285 90	67 15	61 15	23 04	33 01
Elgin	5575 30	3427 49	386 33	270 84	105 17	33 38
Essex	38505 75	11871 67	576 54	228 73	266 77	56 02
Frontenac	45082 53	24962 42	1202 45	517 86	348 82	154 36
Grey	7874 45	2168 10	371 87	144 60	103 72	38 13
Haldimand	2523 90	2063 00	113 54	46 64	32 31	13 52
Halton	317 70	1482 40	95 85	122 22	54 53	47 50
Hastings	28972 21	13616 72	846 07	363 25	262 65	95 10
Huron	6062 27	1858 55	321 46	126 27	116 62	37 71
Kent	13670 20	3632 00	392 35	138 24	130 28	14 00
Lambton	7972 34	9983 59	504 03	152 81	160 94	39 04
Lanark	12190 00	5722 00	780 00	281 00	239 00	91 00
Leeds and Grenville	5205 05	1190 42	256 02	49 12	72 42	15 87
Lennox and Addington	12648 43		175 14	62 28	46 74	19 38
Lincoln	71130 35	4604 39	707 27	463 10	103 14	140 29
Middlesex	153341 58	76192 99	1837 58	593 39	499 62	231 32
Muskoka						
Norfolk	471 25	2149 28	135 39	115 39	40 03	29 49
Northumberland and Durham	29494 53	10556 34	558 93	469 87	188 69	162 72
Ontario	18504 51	3564 97	533 31	94 22	241 05	32 62
Oxford	14825 82	7589 48	318 03	183 67	122 13	39 35
Parry Sound	2723 61	512 82	16 63	16 63		
Peel	4201 11	2295 87	379 25	195 26	162 16	71 83
Perth	21287 49	5990 55	245 78	178 55	47 88	66 56
Peterborough	16809 08	3232 43	485 89	248 57	117 89	76 82
Prescott and Russell	667 72	4121 01	115 46	110 91	12 18	35 07
Prince Edward	20279 25	1481 27	417 83	64 26	119 81	22 76
Renfrew	5462 96	1359 83	446 46	249 93	125 44	105 77
Simcoe	61398 67	17616 04	1065 77	355 20	356 29	102 09
Stormont, Dundas and Glengarry	23444 72	27751 35	1180 17	546 50	333 57	147 35
Thunder Bay	7289 67	1530 96	393 51	64 86	119 24	22 31
Victoria	3745 66	11647 35	357 30	369 14	95 56	49 44
Waterloo	13877 23	2670 42	243 64	430 49	70 53	124 70
Welland	17881 31	975 49	125 34	14 30	40 07	5 36
Wellington	9323 06	2992 00	366 64	250 40	108 51	61 97
Wentworth	91931 07	141789 97	2702 32	1397 21	795 36	483 56
York						
Totals	916338 72	476252 07	21644 99	10627 12	6593 65	3221 22

Registrars and Deputy Clerks of the Crown throughout the Province of Ontario 31st December, 1892.—*Continued.*

Number of Judgments entered after trial.		Total Amount of such Judgments without Costs.		Amount of Costs taxed thereunder.		Total Amount of Disbursements allowed thereunder.		Number of Judgments over.					
Q. B. and C. P. Divs	Chy Div	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Over $10,000.	$10,000 and above $5,000.	$5,000 and above $2,000.	$2,000 and above $1,000.	$1,000 and above $500.	$500 and under.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.						
2	1	444 20	.....	358 97	302 59	197 61	200 80	....	.....	.....	2	3	6
7	2	5787 92	250 00	749 02	217 95	319 92	84 36	....	.....	1	1	10	17
7	4	1186 50	50 00	1100 97	171 83	631 43	79 09	....	1	2	4	9	8
34	8	185312 20	790 00	5543 09	443 71	2659 33	229 89	5	5	8	18	30	39
2	3	.....	.....	315 75	257 35	193 64	147 51	....	.....	1	.....	4	12
7	6	1705 00	225 00	270 84	148 72	53 38	42 00	....	.....	.....	4	10	25
19	7	30498 51	4248 35	804 59	546 21	547 06	34 00	2	2	4	5	12	16
13	7	6508 01	1665 83	1705 07	673 43	754 87	303 41	1	.....	13	12	16	21
4	2	1006 00	1446 21	738 80	160 99	454 37	87 44	....	....	1	5	4	12
1	1	147 17	.....	41 72	293 40	20 47	.....	....	.....	.....	2	3	2
.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	1	3
10	11	2831 64	834 16	1584 96	822 29	834 55	355 55	....	1	5	9	11	34
3	2	150 00	885 16	123 08	76 23	78 64	50 99	....	.....	1	.....	4	13
9	5	7413 93	301 00	993 78	342 51	470 51	161 00	....	.....	5	1	8	6
6	5	610 00	1500 27	1116 63	752 81	395 58	412 80	....	.....	3	4	7	6
4	1	575 00	.....	1015 00	.....	603 00	.....	....	3	2	4	4	13
8	....	1347 29	3000 00	955 64	163 37	337 82	52 97	....	.....	2	.....	8	16
1	3	.....	1032 79	.....	.....	.....	.....	1	.....	.....	.....	1	12
9	2	3187 44	410 12	2176 17	105 28	967 69	57 00	1	2	4	6	8	14
22	11	10663 86	3428 84	4917 77	53 10	1268 26	97 37	7	4	14	17	25	62
1	....	.....	.....	251 52	.....	122 32	.....	....	.....	.....	.....	.....	1
.....	1	.....	141 55	.....	110 40	.....	52 00	....	.....	.....	1	2	3
1	3	.....	300 00	151 47	385 76	84 05	190 02	....	1	7	5	9	25
4	5	500 94	.....	122 18	383 35	142 67	469 25	....	.....	4	4	5	16
11	7	2430 00	2811 72	2370 94	.....	1325 46	.....	....	1	5	4	2	14
.....	.....	.....	.....	.....	.....	.....	.....	....	.....	1	.....	1	.....
5	1	1650 17	.....	411 18	.....	249 64	.....	....	.....	1	2	4	17
10	7	1295 82	1124 65	1490 76	1194 28	1017 72	539 85	1	1	2	1	8	29
2	2	.....	.....	.....	844 03	.....	588 40	....	1	1	2	5	10
2	....	804 28	.....	499 20	.....	100 29	.....	....	.....	1	0	2	2
.....	1	.....	85 00	.....	222 35	.....	119 15	....	.....	4	3	4	8
2	....	3070 98	.....	274 56	.....	152 41	.....	....	.....	2	2	5	3
11	6	5 00	150 00	1213 09	1010 00	574 85	637 80	1	4	8	.....	18	13
5	9	660 88	2186 30	325 05	1602 93	110 73	698 51	1	.....	3	13	12	18
3	2	1000 00	888 57	1146 37	411 12	408 76	246 47	....	.....	1	2	4	11
7	2	1148 71	820 00	1012 55	341 92	549 17	151 00	....	.....	3	3	4	18
9	7	2550 00	.....	959 88	1257 43	589 86	376 67	....	1	1	3	5	5
9	1	.....	475 00	534 94	120 75	150 10	94 71	1	.....	.....	.....	2	5
1	2	.....	.....	221 45	.....	114 81	.....	....	.....	.....	4	7	7
21	8	13361 25	9800 06	1851 50	1897 65	918 01	1150 82	2	3	16	22	46	61
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
270	45	237852 70	38850 58	37348 49	17313 74	17398 98	7710 89	23	30	126	165	323	603

APPENDIX C.—Being a Return of all Business Transacted by Local Registrars, Deputy during the year ending

Counties or Districts.	Number of Executions issued against goods.		Number of executions issued against Land.		Amount of Money Paid into Court with Defence.		Amount of same paid out of Court.	
	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.
					$ c.	$ c.	$ c.	$ c.
Algoma	4	4	4	4				
Brant	18	7	23	10				
Bruce	17	7	14	7	276 50			
Carleton	48	34	44	31		211 67		
Dufferin	10	2	8					
Elgin	15	7	13	7				
Essex	9	13	9	10	6878 29	5 00	6843 89	
Frontenac	50	19	36	13				
Gray	14	7	13	6				
Haldimand	2	3	1	3				
Halton	7	3	7	1				
Hastings	25	22	15	12				
Huron	9	2	10	2				
Kent	14	8	9	8				
Lambton	7	8	6	7				
Lanark	13	3	9	2	4295 00	690 75		
Leeds and Grenville	12	3	8	3				
Lennox and Addington	5	4	2	4				
Lincoln	25	3	16	3	237 50			
Middlesex	69	28	53	22	505 67			
Muskoka	1		1					
Norfolk	2	6	3	4		15 00		
Northumberland and Durham	14	11	12	6				
Ontario	17	1	14					
Oxford	9	5	7	3				
Parry Sound	5	1	3					
Peel	9	3	10	1				
Perth	9	7	6	4				
Peterborough	9	6	6	5	60 00		60 00	
Prescott and Russell	1	1	2	1				
Prince Edward	9	2	8	2	80 00			
Renfrew	4	2	4	1				
Simcoe	35	10	24	11				
Stormont, Dundas and Glengarry	20	14	14	9				
Thunder Bay	8	3	7	3	419 80		419 80	
Victoria	12	9	7	7				
Waterloo	16	10	13	6				
Welland	8	4	6	3				
Wellington	13	55	8	7				
Wentworth	72	39	59	29	120 00			
York	536	313	453	258				
Totals	1182	689	967	515	12872 76	922 42	7323 69	

Registrars and Deputy Clerks of the Crown throughout the Province of Ontario, 31st December, 1892.—*Concluded.*

Balance of Money remaining in Court.		Number of Days of sitting of Judge at Trials.		Amount of Fees collected in Law Stamps by Deputy Clerks and Local Registrars.	Amount of Fees collected in Law Stamps by Deputy Registrars.	Amount of Salary paid Deputy Clerks of the Crown.	Amount of Salary paid Local Registrars as Deputy Registrars in Chancery.	Amount of Fees earned by Deputy Clerks or Local Registrars and payable in cash.	Amount of Fees earned by Deputy Registrars.	Total amount of Salaries paid and Fees earned by Deputy Clerks and Deputy Registrars.
Q. B. and C. P. Divs.	Chy. Divs.	Q. B. and C. P. Divs.	Chy. Divs.							
$ c.	$ c.			$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	.....	3	.....	100 30	.....	.....	150 00	21 00	.....	171 00
.....	.....	11	2	503 50	.....	450 00	225 00	711 45	.....	1386 45
8 15	....	8	2	362 15	489 90	450 00	.....	369 60	489 90	1309 50
.....	.....	21	2	1361 00	.....	450 00	.....	609 20	484 28	1543 48
.....	.....	6	.....	309 10	.....	450 00	225 00	226 60	.....	901 60
.....	.....	18	6	613 80	....	450 00	225 00	289 05	... .	964 05
34 40	.....	12	7	529 90	.....	450 00	.....	255 03	458 94	1163 97
.....	.....	6	6	972 00	.....	450 00	225 00	172 60	.....	847 60
.....	.....	3	3	438 30	.....	500 00	250 00	108 85	.....	858 85
.....	.....	5	.....	145 00	.....	400 00	200 00	123 00	.....	723 00
.....	.....	5	.....	126 60	.....	400 00	200 00	76 60	.....	676 60
.....	.....	58	3	791 70	467 70	450 00	.....	913 75	467 70	1831 45
.....	.....	6	2	310 00	113 90	500 00	.....	390 50	113 90	1004 40
.....	.....	20	2	261 25	475 00	450 00	.. ....	156 00	475 00	1081 00
.....	.....	18	.....	490 20	....	450 00	225 00	365 21	.....	1040 21
.....	.....	3	.....	565 41	....	450 00	225 00	72 21	.....	747 21
.....	.....	11	3	114 07	. .....	500 00	.....	120 87	65 90	800 84
.....	.....	7	.....	251 10	.....	400 00	200 00	180 50	.... ..	780 50
.....	.....	5	.....	452 80	49 30	450 00	.....	468 50	247 91	1166 41
.....	.....	20	6	1496 20	.....	500 00	.....	515 40	535 85	1551 25
.....	.....	2	.....	30 30	... ..	150 00	.....	17 00	.... ..	167 00
.....	.....	5	6	159 60	....	450 00	225 00	197 80	....	872 80
.....	.....	26	2	621 05	.....	500 00	250 00	318 00	.....	1068 00
.....	.....	5	2	371 70	.....	450 00	225 00	125 80	.....	800 80
.....	.....	8	4	411 70	60 86	450 00	.....	448 30	315 03	1213 33
.....	.....	1	.....	31 10	.... ..	600 00	.....	6 00	.....	606 00
.....	... ...	6	.....	280 60	.....	400 00	200 00	146 94	.....	746 94
.....	.....	6	3	685 30	.....	450 00	225 00	796 75	.....	1471 75
....	.....	16	2	507 90	.....	450 00	225 00	511 46	.....	1186 46
.....	.....	4	.....	128 80	.....	450 00	225 00	137 10	.....	812 10
.....	....	9	.....	317 50	.....	400 00	200 00	114 00	.....	714 00
.....	.....	5	.....	205 70	.....	400 00	200 00	37 05	.....	637 05
.....	.....	16	8	557 50	63 50	500 00	.....	486 65	680 05	1730 20
.....	.....	21	6	822 20	.....	500 00	250 00	552 70	.....	1302 70
.....	.....	6	.....	300 10	.....	400 00	200 00	210 68	.....	810 68
.....	.....	13	2	320 00	.....	450 00	225 00	382 20	....	1057 20
.....	.....	16	.....	470 00	.....	850 00	225 00	495 04	....	1570 04
..... .	.....	4	.....	300 10	.....	400 00	200 00	205 20	.....	805 20
.....	.....	12	3	370 00	53 90	500 00	.....	128 38	316 92	945 30
120 00	.....	36	14	1687 40	715 34	500 00	.....	455 17	715 34	1670 51
... .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
162 55	.....	463	96	18772 93	2489 40	17850 00	5425 00	11918 14	5366 72	40737 58

APPENDIX D.—Being a Return of Business Transacted by County Court Clerks

Counties or Districts.	Number of Writs of Summons issued.	Number of Writs of *Ca. Re.* issued.	Total amounts indorsed on Writs of Summons and *Ca. Re.*	Number of Actions entered in Procedure Book.	Number of *lis pendens* issued.	Number of *præcipe* orders issued.	Number of orders issued and signed by Local Judge.	Number of Examinations of Parties.	Number of Actions entered for Trial. (*a*) By Jury.	Number of Actions entered for Trial. (*b*) Without Jury.	Number of Judgments entered without trial.
			$ c.								
Algoma	37	....	11773 03	26	....	6	25	6	6	2	13
Brant	54	....	3748 80	54	....	25	16	15	13	3	17
Bruce	33	....	5805 11	27	1	5	40	10	2	.....	15
Carleton	99	....	20286 33	76	....	15	31	6	8	3	55
Dufferin	22	....	4422 86	16	....	7	17	4	5	....	8
Elgin	66	....	.....	48	....	30	22	22	6	2	17
Essex	80	..	13662 07	66	....	19	13	10	7	8	35
Frontenac	58	..	11888 93	41	....	12	32	10	5	2	31
Grey	47	3	8660 81	35	....	6	5	7	4	1	15
Haldimand	12	....	2158 65	7	....	....	7	....	.....	.....	7
Halton	21	....	4667 53	16	....	6	13	....	2	1	11
Hastings	94	....	19369 40	69	....	29	7	15	20	2	29
Huron	56	1	9895 45	45	....	14	39	17	4	5	25
Kent	81	....	.....	....	1	4	6	26	11	6	.....
Lambton	54	....	.....	47	....	4	17	6	3	1	27
Lanark	27	....	3947 00	25	2	9	32	13	2	1	16
Leeds and Grenville	37	....	6753 65	29	1	3	22	15	2	12	11
Lennox and Addington	8	....	2134 81	6	....	4	15	2	2	....	2
Lincoln	49	..	9825 51	42	1	10	25	9	6	4	22
Manitoulin	6	....	.....	5	....	2	7	....	1	2	2
Middlesex	214	1	30039 10	136	....	31	67	17	9	6	103
Muskoka	5	....	1103 19	5	....	4	9	6	4	1	2
Norfolk	17	....	3558 23	13	....	2	17	1	3	1	2
Northumberland and Durham	32	....	5750 55	7	....	13	27	3	6	.....	35
Ontario	44	....	9170 64	34	....	6	15	3	2	3	21
Oxford	45	1	8499 78	35	....	15	38	20	8	2	17
Parry Sound	2	....	557 17	4	....	....	....	1	.....	1	1
Peel	25	....	5099 64	17	....	5	8	14	3	1	9
Perth	34	....	6297 92	35	....	21	27	13	11	6	20
Peterborough	53	..	12245 72	37	....	16	11	7	9	2	38
Prescott and Russell	21	....	3671 65	14	1	2	17	2	.....	1	10
Prince Edward	12	....	2495 91	9	....	....	11	6	2	.....	3
Rainy River	24	....	13031 02	22	1	....	23	8	.....	3	4
Renfrew	41	....	5683 81	....	....	6	23	1	.....	.....	20
Simcoe	83	....	17344 42	....	....	....	....	21	7	5	37
Stormont, Dundas and Glengarry	100	....	18375 41	75	4	13	58	5	5	2	50
Thunder Bay	38	....	15796 31	37	....	16	60	5	2	3	19
Victoria	34	....	7470 36	34	....	8	21	12	5	1	19
Waterloo	51	....	9350 22	46	2	17	25	11	.....	8	28
Welland	26	....	4532 26	25	....	9	32	9	2	1	18
Wellington	46	....	9674 19	23	2	3	14	5	4	1	16
Wentworth	161	....	32410 58	128	2	36	95	17	11	8	80
York	1188	....	230915 42	822	37	175	595	36	54	52	515
Totals	3237	6	592073 44	2238	55	608	1584	416	256	163	1425

throughout the Province, during the year ending 31st December, 1892.

(a) Total amount of such Judgments without costs.	(b) Total amount of costs taxed thereunder.	(c) Total amount of Disbursements allowed.	Number of Judgments entered after Trial.	(a) Total amount of such Judgments without costs.	(b) Total amount of Costs taxed thereunder.	(c) Total amount of Disbursements allowed.	No. of Transcripts of Judgments received from Division Courts.	Number of Judgments.			Number of days of sitting of Judge at Trials.	Amount of money paid into Court with defence.
								Over $200.	$200 and over $100.	$100 and under.		
$ c.	$ c.	$ c.		$ c.	$ c.							$ c.
5319 87	433 38	112 72	4	400 75	641 77	350 54	4	11	4	1	5	.....
3433 23	363 67	104 37	2	261 90	344 64	191 99	11	14	5	....	15	375 00
3098 14	379 25	115 98	3	145 00	242 26	149 16	20	8	6	3	3	.....
12303 79	923 93	290 67	5	666 23	422 53	223 13	63	37	17	3	12	173 50
1870 54	106 30	49 46	.....	.....	.....	.....	20	7	1	....	3	.....
3755 99	352 31	110 05	2	200 00	154 49	79 30	16	11	....	2	12	.....
7176 30	862 92	169 83	9	1175 31	524 59	260 00	31	22	13	4	11	.....
6093 10	490 95	194 27	3	576 00	18 37	7 90	9	21	12	1	9	.....
2996 63	284 59	93 67	2	233 12	52 03	16 99	29	9	6	2	6	.....
1284 29	186 88	76 86	.....	.....	.....	.....	7	4	1	2	....	.....
2770 20	151 65	60 59	.....	.....	.....	.....	7	9	1	1	....	.....
6968 54	478 57	130 65	10	814 84	1297 99	701 02	18	21	10	8	16	€ 00
5189 64	551 32	187 61	2	.....	275 96	199 78	17	12	7	6	10	.....
8086 84	705 41	237 49	2	100 00	208 60	132 10	19	20	16	2	20	125 62
4320 45	529 87	143 00	2	305 57	107 60	62 61	28	13	10	6	3	.....
3737 00	277 00	74 00	2	.....	257 00	97 00	10	7	4	1	2	122 00
2070 95	213 71	60 66	6	479 57	391 59	201 39	21	10	4	3	9	5 00
235 25	38 99	10 89	3	300 00	578 37	317 78	4	....	2	3	4	200 00
4382 77	398 89	131 35	2	.....	271 65	150 90	16	13	7	4	7	165 00
461 84	35 24	3 94	3	60 35	878 70	311 03	....	2	....	1	4	.....
22650 69	1742 32	515 64	5	535 99	724 70	285 61	27	59	41	8	15	215 32
633 33	26 39	6 49	3	179 14	279 50	151 44	3	2	3	....	1	.....
720 18	32 06	11 21	2	303 75	283 18	142 23	13	2	2	....	2	.....
5900 63	318 43	109 75	2	.....	120 82	106 24	18	16	10	11	6	350 00
4834 50	247 67	111 00	3	555 75	143 01	187 19	16	15	7	2	8	.....
4029 35	347 35	117 75	3	200 83	267 96	152 21	12	13	6	1	9	481 30
246 10	21 59	.....	.....	.....	.....	.....	3	1	....	....	3	.....
1439 66	231 81	77 48	5	632 78	626 44	364 53	7	4	5	5	7	.....
3466 06	289 96	92 40	5	853 14	903 81	384 53	4	10	11	4	14	.....
6677 88	412 16	132 77	6	671 10	642 68	335 31	20	17	15	12	10	.....
1981 47	191 28	60 72	2	332 79	45 24	26 25	6	6	5	1	2	.....
664 35	39 97	10 57	1	.....	98 66	55 71	11	6	1	....	3	40 92
1123 66	118 35	30 30	.....	.....	.....	.....	2	2	....	1	3	100 00
3812 11	467 02	143 05	1	289 04	.....	.....	18	9	11	1	5	.....
9501 49	689 21	218 73	5	471 48	766 96	527 43	31	....	....	....	7	.....
9301 41	1207 10	340 23	3	332 14	426 40	152 92	18	25	21	7	11	77 50
10180 64	464 59	120 29	6	987 56	695 96	373 36	5	17	4	4	4	236 64
4036 24	303 86	96 31	1	275 54	284 12	127 70	14	....	....	....	3	90 00
6288 22	556 85	143 65	1	311 35	556 85	.....	15	16	11	1	5	.....
3670 58	311 23	115 57	2	175 90	45 10	26 38	16	10	6	4	8	123 25
3991 13	369 66	113 85	3	299 00	167 25	63 39	14	....	12	4	5	100 00
17555 53	1899 62	635 50	7	831 50	828 59	405 35	37	54	24	8	18	458 93
113009 44	8612 51	2280 85	49	4444 09	4642 55	1451 57	212	320	182	62	76	928 89
321270 01	26665 80	7842 17	177	18393 51	19217 92	8771 97	872	855	503	189	376	4374 87

APPENDIX D.—Being a Return of Business Transacted by County Court Clerks through-

Counties or Districts.	Amount paid out.	Balance in Court.	Number of Writs of Execution issued against goods.	Number of Writs of Execution issued against lands.	Number of Writs of *Ca. Sa.* issued.	Number of Certificates under Creditors' Relief Acts.	Amounts for which issued, without Costs.	Amount of Costs allowed thereunder.
	$ c.	$ c.					$ c.	$ c.
Algoma			10	11	....	....		
Brant	95 00	280 00	45	53	....	2	101 24	13 99
Bruce			12	12	....	3	550 15	29 45
Carleton	143 50		63	57	1			
Dufferin			26	24	....	5	833 27	57 60
Elgin			31	29	....	....		
Essex			56	51	....	....		
Frontenac			59	61	....	3	2323 21	47 15
Grey			36	55	1	....		
Haldimand			16	21	....	....		
Halton			22	21	....	5	262 64	15 75
Hastings			45	33	....	9	4162 77	96 01
Huron			38	37	....	....		
Kent	99 12	26 50	19	19	....	2	369 18	18 22
Lambton			18	16	....	3	242 10	34 00
Lanark	122 00		21	19	....	....		
Leeds and Grenville	5 00		13	9	....	2	119 17	8 25
Lennox and Addington	253 30		9	6	....	....		
Lincoln	135 00	30 00	36	30	....	....		
Manitoulin			10	5	....	....		
Middlesex	142 75	62 57	143	139	....	6	1218 16	61 05
Muskoka			7	8	....	....		
Norfolk			15	13	....	....		
Northumberland and Durham	152 19	278 81	30	27	....	3	276 29	26 05
Ontario			48	57	....	4	628 96	19 66
Oxford	896 32		31	31	....	7	815 08	42 19
Parry Sound				3	....	1	188 00	4 76
Peel			18	13	....	6	1065 70	67 13
Perth			18	14	....	....		
Peterborough	70 40		33	29	....	1	196 00	
Prescott and Russell			8	15	....	2	326 97	11 50
Prince Edward	169 99		13	12	....	25	1981 92	107 23
Rainy River	100 00		3	3	....	....		
Renfrew			18	16	....	....		
Simcoe			64	60	....	1	214 42	
Stormont, Dundas and Glengarry	149 85		55	67	....	....		
Thunder Bay			24	20	....	....		
Victoria	90 00		44	43	....	....		
Waterloo			49	45	1	....		
Welland	123 25		34	28	....	1	265 00	3 60
Wellington	101 30		25	26	....	....		
Wentworth	451 70	7 23	117	94	1	....		
York	1632 26	34335 70	705	621	4	5	1471 25	28 95
Totals	4932 93	35020 81	2087	1953	8	96	17611 28	672 54

out the Province of Ontario, during the year ending 31st December, 1892.—*Concluded.*

Number of Partition Matters.	Amount of money paid thereunder.	Amount paid out.	Amount at joint credit of Judge and Clerk, including interest allowed.	Number of Chattel Mortgages and Bills of Sale filed.	Total amount secured by such Mortgages.	Number of Mortgages renewed.	Number of Discharges filed.	Number of Assignments filed under R. S. O., chap. 124.	Number of Hire receipts filed under 57 Vict. chap. 19.	Total amount secured by such receipts, etc.	Amount of fees earned by Clerk of Court, not including salary paid.
	$ c.	$ c.	$ c.		$ c.					$ c.	$ c.
.	.....	.....	.....	171	307564 38	15	.....	.....	4	380 00	324 45
..	.....	.....	.....	395	197372 46	151	14	13	105	9257 36	942 10
..	.....	325 11	7155 05	633	188453 00	264	8	11	54	10152 00	1052 97
..	.....	.....	.....	399	231661 07	275	49	36	35	7694 45	1235 80
..	.....	.....	.....	263	71790 11	73	7	9	85	6261 82	475 95
	.....	.....	.....	365	155840 76	142	14	15	70	12937 00	623 95
..	.....	.....	.....	499	180072 41	142	6	10	70	17016 93	793 00
..	.....	.....	290 68	452	182673 99	142	6	12	47	3100 50	650 96
..	.....	.....	.....	1225	513805 94	336	8	13	84	2783 55	976 30
..	.....	.....	.....	194	48833 36	25	2	5	7	816 61	210 75
..	.....	.....	.....	95	59310 36	35	6	2	15	1758 10	269 10
..	.....	.....	1321 29	877	258246 40	271	18	10	147	14117 78	1358 47
2	911 41	194 23	1055 56	335	118486 59	112	3	17	33	7872 39	704 20
..	.....	.....	26 50	1139	413228 45	300	14	17	159	12158 35	998 30
..	.....	.....	.....	446	142075 64	151	26	14	84	12195 62	700 70
..	.....	.....	.....	243	125195 22	71	4	14	11	834 83	420 85
..	.....	.....	134 93	332	109212 72	159	13	22	24	3670 00	796 78
..	.....	.....	.....	142	46900 70	92	4	.....	40	3558 90	338 91
..	.....	.....	.....	191	110139 79	111	6	12	9	910 00	673 20
..	.....	.....	.....	118	247887 76	27	5	.. .	33	1843 50	122 11
..	.....	.....	815 31	514	144297 27	254	19	19	99	15474 50	1359 80
..	.....	.....	.....	.....	.....	.....	....	.....	24	3905 45	117 14
..	2608 20	2561 29	2411 31	208	38533 34	113	4	12	180	5518 08	476 18
..	.....	.....	.....	523	186096 05	324	14	12	44	15207 98	933 88
..	.....	.....	.....	355	124175 98	164	10	15	66	8596 51	693 55
..	.....	726 37	2130 54	234	119805 88	88	18	22	16	6748 00	814 28
..	.....	.....	.....	150	157138 51	24	3	7	43	7244 58	12 90
..	.....	.....	54 21	139	57499 11	47	8	12	2	350 00	375 49
..	.....	.....	.....	331	155227 60	93	10	12	10	4487 50	619 65
..	.....	.....	.....	342	162867 66	112	4	8	14	5606 00	563 05
..	.....	.....	.....	224	320257 07	48	1	4	12	576 00	294 17
..	.....	.....	.....	146	54632 03	77	11	3	30	4501 91	365 85
..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180 95
..	.....	.....	.....	128	32882 36	95	3	5	56	4182 00	479 64
..	.....	.....	.....	662	328941 57	259	8	29	173	15520 21	1284 77
..	.....	.....	.....	460	162641 98	113	7	23	41	3858 62	887 45
..	.....	.....	.....	40	11479 83	11	6	7	110	13177 05	351 57
..	.....	.....	.....	371	187302 70	135	10	14	83	9894 01	641 79
5	1687 06	403 87	1283 19	137	100695 59	83	11	18	61	9168 15	440 80
4	956 42	712 53	243 89	316	171511 59	84	15	11	32	4258 85	528 45
..	.....	112 65	4841 18	501	238206 48	140	6	7	90	7857 15	583 00
..	.....	.....	.....	395	157691 99	220	21	20	58	12754 74	1504 76
..	.....	.....	1285 71	1803	1468718 35	533	79	170	186	73165 85	6586 05
..	6163 09	5036 05	23049 35	15493	8089354 05	5911	481	662	2546	361372 83	33764 02

APPENDIX E.—Being a Return of business transacted by Surrogate Registrars throughout

Counties or Districts.	Number of Probates issued.	Number of Letters of Administration issued.	Number of Letters of Guardianship issued.	Number of Probates and Letters issued under R.S.O. 1887, c. 50, s. 67, as amended by 53 Vic. c. 17, s. 17, and included in the previous numbers.	Above $100,000.	From $50,000 to $100,000.	From $25,000 to $50,000.	From $10,000 to $25,000.	From $5,000 to $10,000.	From $1,000 to $5,000.
Algoma	4	6	.....	2	.....	.....	.....	1	....	5
Brant	69	47	5	20	1	3	.....	4	14	27
Bruce	93	44	5	15	1	.....	1	1	4	56
Carleton	100	71	4	15	3	2	4	8	9	48
Dufferin	34	15	.....	9	.....	.....	.....	.....	2	17
Elgin	76	58	6	18	.....	.....	.....	1	11	47
Essex	67	27	3	5	.....	..	1	3	9	26
Frontenac	42	25	2	9	.....	.....	2	4	4	20
Grey	93	51	1	11	.....	.....	1	....	11	39
Haldimand	67	31	2	20	.....	1	.....	1	4	37
Halton	50	18	3	5	....	1	2	2	4	34
Hastings	72	37	4	14	.....	1	2	5	7	29
Huron	157	57	7	12	.....	.....	2	8	20	96
Kent	83	51	5	12	.....	1	3	5	3	55
Lambton	92	51	7	24	.....	1	.....	3	6	50
Lanark	44	22	2	8	.....	.....	.....	1	5	18
Leeds and Grenville	97	41	2	11	.....	.....	.....	4	9	41
Lennox and Addington	36	13	.....	6	.....	.....	1	1	3	13
Lincoln	46	26	1	7	.....	.....	2	6	1	17
Manitoulin	1	5	.....	2	.....	.....	.....	.....	.....	.....
Middlesex	203	113	9	29	....	1	1	4	23	124
Muskoka	9	5	.....	2	....	.....	.....	.....	.....	3
Norfolk	57	21	1	9	1	.....	1	2	2	23
Northumberland and Durham	119	59	1	18	.....	.....	6	5	11	62
Ontario	79	45	5	15	.....	.....	1	3	7	44
Oxford	86	43	3	11	1	.....	2	1	8	63
Parry Sound	5	2	...	.....	.....	.....	.....	.....	.....	2

the Province of Ontario during the year ending 31st December, 1892.

From $400 to $1,000.	$400 and under.	Total amount of personalty devolving.	Total amount of realty.	Registrar's Fees.	Judge's Fees.	Fee Fund.	Total.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1	3	23690 36	... .	86 29	41 00	27 50	154 79
19	53	679025 03	365712 00	979 85	878 00	517 50	2375 35
49	28	284560 00	254930 00	1116 05	530 00	364 00	2010 05
26	75	2565819 67	76630 00	1557 45	2852 00	1592 00	6001 45
9	21	63421 19	23250 00	387 75	149 50	102 50	639 75
28	45	210881 75	336371 00	1162 17	612 70	317 00	2091 87
25	30	1158382 83	251525 00	726 95	395 00	256 51	1378 46
11	28	152639 90	169250 00	685 40	530 80	193 00	1409 20
42	52	174972 63	102247 00	1161 95	582 00	355 00	2098 95
18	39	200854 00	273195 00	943 40	403 20	246 50	1593 10
8	17	239318 87	211833 11	736 25	404 60	239 00	1379 85
28	41	377722 00	32006 00	903 63	577 30	351 00	1831 93
40	43	541368 11	84081 00	1953 85	1281 50	631 00	3866 35
15	52	329840 13	560 00	907 57	585 00	379 50	1872 07
31	46	302676 72	316591 00	907 46	543 50	374 00	1824 96
14	28	112134 30	112116 00	530 90	238 50	166 50	935 90
24	62	265258 68	92450 47	1198 05	564 60	375 00	2137 65
19	12	133199 34	18945 00	444 40	301 50	141 50	887 40
20	26	235990 50	121873 00	677 45	471 30	243 00	1391 75
1	5	2844 75	2700 00	64 80	15 50	10 50	90 80
83	89	707832 76	141880 00	2491 30	1413 50	857 00	4761 80
3	8	9152 59	13775 00	103 05	35 50	24 50	163 05
16	38	386703 10	44527 00	812 60	609 70	359 00	1781 30
37	59	504003 41	348508 00	1369 88	795 50	537 50	2702 88
22	47	244501 57	40186 66	1027 00	533 00	306 00	1866 00
19	35	388759 74	54272 25	1275 70	762 80	410 00	2448 50
2	2	8617 00	800 00	58 70	23 50	19 80	102 00

APPENDIX E.—Being a Return of business transacted by Surrogate Registrars throughout

Counties or Districts.	Number of Probates issued.	Number of Letters of Administration issued.	Number of Letters of Guardianship issued.	Number of Probates and Letters issued under R.S.O. 1887, c. 50, s. 67, as amended by 53 Vic., c. 17, s. 17, and included in the previous numbers.	Above $100,000.	From $50,000 to $100,000.	From $25,000 to $50,000.	From $10,000 to $25,000.	From $5,000 to $10,000.	From $1,000 to $5,000.
Peel	52	35	3	15	.....	.....	1	1	7	30
Perth	104	49	1	13	1	1	2	2	6	57
Peterborough	45	21	2	11	.....	1	2	6	3	7
Prescott and Russell	23	17	1	6	.....	.....	.....	.....	1	11
Prince Edward	37	12	.....	6	.....	.....	1	1	3	19
Rainy River	4	2	.....	.....	.....	.....	.....	.....	.....	3
Renfrew	31	35	1	8	.....	1	2	.....	2	17
Simcoe	95	49	5	20	.....	.....	2	6	5	37
Stormont, Dundas, Glengarry	62	30	5	3	.....	2	1	1	10	41
Thunder Bay	6	6	.....	3	.....	.....	.....	1	.....	1
Victoria	45	14	3	1	2	.....	.....	2	4	28
Waterloo	104	41	4	7	.....	.....	1	4	16	49
Welland	35	33	7	3	. .	....	.....	2	5	26
Wellington	136	55	4	.....	1	.....	1	2	9	79
Wentworth	150	74	10	34	.....	5	2	11	20	70
York	353	224	37	93	8	10	11	35	53	183
Total	3163	1681	161	532	19	31	58	147	321	1654

the Province of Ontario during the year ending 31st December, 1892.—*Concluded.*

From $400 to $1,000.	$400 and under.	Total amount of personalty devolving.	Total amount of realty.	Registrar's Fees.	Judge's Fees.	Fee Fund.	Total.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
17	31	173838 89	214301 00	692 38	321 50	206 00	1219 88
28	57	521412 29	121658 85	1255 60	971 40	513 50	2740 50
5	24	313934 75	230560 00	630 02	469 00	272 00	1371 02
10	18	41345 13	91349 00	289 13	112 00	84 00	485 13
6	19	130665 54	12226 00	400 80	214 50	143 00	758 30
2	1	8550 19	500 00	48 55	15 00	16 00	79 55
11	26	187696 51	10800 00	502 20	307 50	193 00	1002 70
16	26	324776 90	73535 00	1211 15	567 50	404 00	2182 65
25	17	351419 95	250 00	810 43	490 00	335 00	1635 43
3	5	19866 37	....	80 13	29 00	26 00	135 13
13	13	522140 00	173384 00	513 46	450 00	293 50	1256 96
25	54	401122 01	356098 33	1171 82	643 00	232 00	2251 82
24	18	141445 79	152403 75	985 55	401 70	205 50	1592 75
34	55	440636 90	485631 50	1763 70	857 70	556 00	3177 40
35	91	935941 60	763220 77	1884 93	1379 10	832 00	4096 03
77	239	4878710 00	95293 00	5047 09	2990 50	3447 00	11484 59
941	1678	18997673 55	6271425 19	41556 79	26350 40	17154 81	85062 00

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the different year ending 31st

County or District.	County Town.	Office.	Officers.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c
Algoma	Sault Ste. Marie.	Sheriff	W. H. Carney	1957 53	1000 00
		Surrogate Judge	*Judge Johnston	41 00	
		Local Master	"	56 15	
		District Attorney	J. J. Kehoe	302 59	
		Clerk of the Peace	"	396 23	800 00
		Local Registrar	T. A. P. Towers	21 00	150 00
		District Court Clerk	"	324 45	600 00
		Surrogate Registrar	"	86 29	
Brant	Brantford	Sheriff	W. Watt, jr	2669 12	
		Surrogate Judge	Judge Jones	commuted at	
		Local Master	†	commuted at	
		County Attorney	G. R. VanNorman, Q.C.	810 00	
		Clerk of the Peace	"	973 61	
		Local Registrar	W. B. Rubidge	711 45	675 00
		County Court Clerk	"	942 10	
		Surrogate Registrar	"	979 85	
Bruce	Walkerton	Sheriff	‡Fred S. O'Connor	372 01	
		Surrogate Judge	Judge Kingsmill	commuted at	
		Local Master & Deputy Registrar	W. A. McLean	commuted at	
		County Attorney	Thos. Dixon	431 70	
		Clerk of the Peace	"	1396 12	
		Deputy Clerk of the Crown	Wm. Gunn	369 60	450 00
		County Court Clerk	"	1052 97	
		Surrogate Registrar	"	1116 05	
Carleton	Ottawa	Sheriff	John Sweetland	5323 90	
		Surrogate Judge	Judge Ross	commuted at	
		Local Master	W. M. Matheson	2260 48	
		Deputy Registrar	"	484 28	
		County Attorney	Robert Lees, Q.C	581 99	

*From 1st July. †W. D. Jones appointed to act *pro tem* Nov. 5th. ‡From 9th Nov.

County Judicial Officers in the Province of Ontario, earned and received during the December, 1892.

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.		Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
.....	2957 53	2720 70	57 57	.....	2778 27	1463 96	1314 31	1493 57		3267 99	1794 30
41 00	.....	41 00	.....	41 00	.....	....	41 00	.....	§	... .	... .
56 15	97 15	51 15	.....	51 15	97 15	.....	51 15	97 15	§	.....	.....
302 59	.....	197 59	88 00	285 59	.. ....	.....	285 59	.....		389 31	389 31
1196 23	1498 82	1092 63	151 02	1243 65	1529 24	6 00	1237 65	1492 82		972 85	972 61
171 00	.....	171 00	.....	171 00	.... ..	10 00	161 00	.....		222 80	212 80
924 45	....	924 45	14 10	938 55	.....	35 00	903 55	....		910 30	890 48
86 29	1181 74	86 29	.....	86 29	1195 84	.....	86 29	1136 74		76 22	65 42
... .	2669 12	2440 75	166 73	.....	2607 48	682 37	1925 11	1986 75	§	.. ..	.....
.....	.....	360 00	.....	360 00	... ...	.....	360 00	.....		... . ..	.....
.....	.....	577 00	.....	577 00	937 00	25 00	552 00	912 00		.....	.....
810 00	.....	810 00	.....	810 00	.....	8 00	802 00	.....		982 63	972 03
973 61	1783 61	973 61	.....	973 61	1783 61	65 50	908 11	1710 11		1093 80	1058 00
1386 45	.....	1381 25	....	1381 25	.....	352 10	1029 15	.....		1294 05	1043 15
943 10	.....	935 05	.....	935 05	.....	193 30	741 75	.....		802 25	636 35
979 85	3308 40	975 65	.....	975 65	3291 95	200 00	775 65	2563 00		811 07	654 41
....	372 01	87 91	.....	.....	87 91	138 41	.....	233 60	§	.. ..	.....
....	408 00	408 00	.....	.....	408 00	.....	.....	408 00		.....	.....
.....	850 00	. .....	850 00	.....	.....	10 00	.....	840 00		.....	....
431 70	.....	277 40	273 20	550 60	.....	20 00	530 60	.....		843 80	825 24
1396 12	1827 82	895 69	478 20	1373 89	1924 49	68 87	1305 02	1738 95		1665 88	1547 74
819 60	.....	819 60	122 00	941 60	.....	170 00	771 60	.....		717 25	666 45
1052 97	. .....	1041 05	173 00	1214 05	.....	265 00	949 05	.....		1074 40	668 11
1116 05	2938 62	977 97	155 00	1132 97	3288 62	255 00	877 97	2248 62		926 57	657 20
.....	5323 93	4896 53	586 73	.....	5483 26	2685 32	2797 94	2638 58		5916 22	3031 69
.....	500 00	500 00	.....	... .	500 00	.....	.....	500 00		.....	.....
2260 48	....	2216 22	18 19	2234 41	.....	141 08	2093 33	.....		2410 11	2294 38
484 28	2744 76	482 68	1 80	484 48	2718 89	126 06	358 42	2477 62		705 52	639 81
581 99	.....	404 79	106 00	510 79	.....	.....	510 79	.. ..		583 27	540 49

§Not five years in office. Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Carleton—*Con* ..	Ottawa.....	Clerk of the Peace	Robt. Lees, Q.C	1197 39	.....
		Deputy Cl'k of the Crown	J. P. Featherston.....	609 20	450 00
		County Court Clerk	"	1235 80	.....
		Surrogate Registrar.....	"	1557 45	.....
Dufferin	Orangeville.....	Sheriff	Thos. Bowles.....	2329 65	.....
		Surrogate Judge.....	Judge McCarthy	commuted at	
		Local Master.....	"	177 29	.....
		County Attorney	*W. J. L. McKay	53 00	.....
		Clerk of the Peace.....	"	624 26	.....
		Local Registrar.....	John McLaren	226 60	675 00
		County Court Clerk	"	475 95	.....
		Surrogate Registrar.....	"	387 75	.....
Elgin	St. Thomas.....	Sheriff	Dugald Brown	2713 56	... .
		Surrogate Judge.....	Judge Hughes..... ..	612 00	.....
		Local Master	Robert Miller	1357 48	.....
		County Attorney.....	D. J. Donahue	994 57	.....
		Clerk of the Peace.....	"	1118 48	.....
		Local Registrar.	D. McLaws	289 05	675 00
		County Court Clerk	"	623 95	.....
		Surrogate Court	"	1162 17	.....
Essex	Sandwich	Sheriff	J. C. Iler	3951 06	.....
		Surrogate Judge..... ..	Judge Horne	395 00	.....
		Local Master	†S. S. Macdonell, Q.C..	912 45	....
		Deputy Registrar.....	† " ..	458 94	.....
		County Attorney.	† " ..	469 19	.....
		Clerk of the Peace.....	† " ..	897 67	.....
		Deputy Cl'k of the Crown	F. E. Marcon	255 03	450 00
		County Court Clerk	"	793 00	....
		Surrogate Registrar.....	"	726 95	.....
Frontenac.....	Kingston	Sheriff	Wm. Ferguson	1732 55	.....

* From 6th August. † A. H. Clarke *pro tem.*

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for year 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1197 39	1779 38	930 10	204 34	1134 44	1645 23	15 22	1119 22	1764 16	1087 84	1062 18
1059 20	.....	968 22	163 22	1131 44	.....	400 00	731 44	.....	1073 09	812 49
1235 80	.. ..	1073 10	70 10	1143 20	.....	300 00	843 20	.....	1176 69	934 98
1557 45	3752 45	1413 17	273 10	1686 27	3960 91	528 56	1157 71	2523 59	1357 12	920 69
.....	2329 65	1963 77	374 41	.....	2338 18	676 76	1661 42	1652 89	2448 29	1696 32
168 00	.....	168 00	.....	168 00	....	.....	168 00	... .	†	.....
177 29	345 29	161 79	10 20	171 99	339 99	4 10	167 89	341 19	196 74	187 58
53 00	.....	53 00	... .	53 00	.....	.....	53 00	.....	*	.....
624 26	677 26	624 26	.....	624 26	677 26	35 00	589 26	642 26	*	.....
901 60	.....	893 70	.....	893 70	....	11 75	881 95	....	881 14	858 42
475 95	.....	450 25	3 50	453 75	.....	11 50	442 25	.....	331 34	361 20
387 75	1765 30	387 75	.....	387 75	1735 20	27 25	360 50	1714 80	353 55	332 73
... .	2713 56	2019 51	699 10	.....	2718 61	1328 00	1390 61	1385 56	3601 30	1941 39
.....	....	612 00	.....	.....	612 00	.....	612 00	.....	529 82	529 82
.....	1357 48	756 62	662 57	.....	1419 19	82 00	1337 19	1275 48	1271 24	1208 12
994 57	....	731 67	178 62	910 29	.....	100 00	810 29	....	1044 45	916 63
1118 48	2113 05	870 48	254 26	1124 74	2035 03	50 00	1074 74	1963 05	1017 56	949 10
964 05	.....	922 95	41 00	963 95	. .....	69 00	894 95	.....	1099 70	1016 94
623 95	.....	570 20	45 30	615 50	.....	80 00	535 50	.....	703 19	629 51
1162 17	2750 17	1092 95	54 10	1147 05	2726 50	200 00	947 05	2401 17	970 15	815 83
.....	3951 06	2910 06	838 12	.....	3748 18	1786 38	1961 80	2164 68	4358 39	2687 56
.....	395 00	....	.....	.....	395 00	.....	.....	395 00	373 20	373 20
912 45	.....	502 75	76 90	639 65	.....	.....	639 65	.....	648 02	578 42
458 94	.....	433 10	.....	433 10	.....	.. ....	433 10	.....	315 56	304 30
469 19	.....	354 11	148 00	502 11	....	.....	502 11	.....	514 57	475 82
897 67	2738 25	637 78	267 36	905 14	2480 00	5 00	900 14	2733 25	832 10	705 70
705 03	.....	705 03	.....	705 03	.....	.....	705 03	.....	919 89	896 89
793 00	.....	793 00	.....	793 00	.....	180 00	613 00	.....	708 06	637 06
726 95	2224 98	726 95	.....	726 95	....	..... .	726 95	2044 98	670 66	658 52
.....	1732 55	1732 55	.....	....	1732 50	523 89	1208 66	1208 66	2050 49	1573 09

* Not five years in office. † Commuted on average of previous five years.

APPENDIX F.—Schedule shewing return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount earned.	Salary paid by the Government.
				$ c.	$ c.
Frontenac—*Con.*	Kingston	Surrogate Judge	Judge Price	commuted at	
		Local Master	J. M. Machar, Q.C	632 18	
		County Attorney	J. L. Whiting, Q.C	507 80	
		Clerk of the Peace	"	1087 39	
		Local Registrar	Archibald McGill	172 60	675 00
		County Court Clerk	"	650 96	
		Surrogate Registrar	"	685 40	
Grey	Owen Sound	Sheriff	C. H. Moore	3311 52	
		Surrogate Judge	Judge Lane	582 00	
		Local Master	Alfred Frost	174 20	
		County Attorney	"	342 80	
		Clerk of the Peace	Wm. Armstrong	933 26	
		Local Registrar	George Inglis	108 85	750 00
		County Court Clerk	"	976 30	
		Surrogate Registrar	"	1161 95	
Haldimand	Cayuga	Sheriff	R. H. Davis	2205 32	
		Surrogate Judge	Judge Upper	403 20	
		Local Master	"	82 10	
		County Attorney	J. R. Martin	981 10	
		Clerk of the Peace	"	1502 11	
		Local Registrar	Jas. Mitchell	123 00	600 00
		County Court Clerk	"	210 75	
		Surrogate Registrar	"	943 40	
Halton	Milton	Sheriff	M. Clements	1522 79	
		Surrogate Judge	*Judge Kingsmill	404 60	
		Local Master	"	89 10	
		County Attorney	T. G. Matheson	449 80	
		Clerk of the Peace	"	1168 89	
		Local Registrar	Walter A. Lawrence	76 60	600 00

* *Pro tem.*

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	752 00	752 00	....	... .	752 00	.....	752 00	752 00	†	
632 18	.....	474 26	290 87	765 13	.....	100 00	665 13	.....	*	
507 80	.....	293 00	103 00	396 00	.....	26 25	369 75	.....	*	
1087 39	1595 19	616 04	386 65	1002 69	1398 69	308 90	693 79	1260 04	*	
847 60	.....	837 60	10 00	847 60	.....	234 00	613 60	.....	*	
650 96	.....	555 53	118 80	674 33	.....	243 00	431 33	.....	*	
685 40	2183 96	600 40	70 00	670 40	2192 33	255 30	415 10	1451 66	*	
. .....	3311 52	2595 98	1533 54	.....	3251 92	1533 54	1718 38	1777 98	3998 61	2207 01
.....	582 00	582 00	.....	.....	582 00	.....	.....	582 00	†	
174 20	.....	85 31	116 51	201 82	.....	.....	201 62	.....	181 09	181 09
342 80	517 00	224 80	67 40	292 20	494 02	19 00	273 20	498 00	311 23	279 33
.....	933 26	609 65	184 55	... .	794 20	.....	794 20	933 26	1425 50	1375 01
858 85	.....	858 85	.....	858 85	... .	21 25	837 60	. .. .	909 88	878 93
976 30	.....	961 20	19 85	981 05	.....	42 55	938 50	... .	867 34	819 63
1161 95	2997 10	1022 50	36 20	1058 70	2898 60	285 20	773 50	2648 10	889 46	631 82
..... .	2205 52	2124 66	116 72	.....	2241 38	415 54	1825 84	1889 98	2136 11	1690 21
403 20	.....	403 20	.....	403 20	.....	.....	403 20	485 30	270 58	270 58
82 10	485 30	42 50	.....	42 50	445 70	.....	42 50	485 30	66 10	62 10
981 10	.....	747 60	264 02	1011 62	....	25 00	986 62	.....	670 55	636 66
1502 11	2483 21	942 56	466 42	1408 98	2420 60	350 00	1058 98	2188 21	1283 82	965 21
723 00	.....	723 00	.....	723 00	.....	20 00	703 00	.....	705 81	688 95
210 75	.....	210 75	.....	210 75	.....	25 00	185 75	.....	244 37	224 37
943 40	1877 15	943 40	.....	943 40	1877 15	100 00	843 40	1732 15	681 70	594 70
.....	1522 79	1466 00	53 49	.....	1519 49	445 00	1074 49	1077 79	1624 78	1133 87
404 60	.....	.....	....	404 60	.. ....	.....	404 60	....	*	
89 10	493 70	76 10	.....	76 10	480 70	.....	76 10	493 70	*	
449 80	.....	401 40	143 70	545 11	.....	12 00	533 11	.....	*	
1168 89	1618 69	708 65	448 28	1156 93	1702 04	24 53	1132 40	1582 16	*	
676 60	.....	676 60	..... .	676 60	.....	190 00	486 60	.....	*	

†Commuted on average of previous five years. *Not five years in office.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Halton—*Con*	Milton	County Court Clerk.....	Walter A. Lawrence.	269 10	.....
		Surrogate Registrar.....	"	736 25	.....
Hastings	Belleville.....	Sheriff	Wm. Hope.....	4733 90	.....
		Surrogate Judge	Judge Lazier	commuted at	
		Local Master and Deputy Registrar	S. S. Lazier	commuted at	
		County Attorney	G. E. Henderson, Q.C.	623 65	.....
		Clerk of the Peace	"	1448 07	.....
		Deputy Clerk of the Crown	A. G. Northrup	913 75	450 00
		County Court Clerk.....	"	1358 47	.....
		Surrogate Registrar	"	903 63	.....
Huron	Goderich	Sheriff	R. Gibbons.....	3121 21	.....
		Surrogate Judge	Judge Toms	commuted at	
		Local Master and Deputy Registrar.....	S. Malcomson	commuted at	
		County Attorney	Ira Lewis	396 90	.....
		Clerk of the Peace.	"	1271 45	.....
		Deputy Clerk of the Crown	D. Macdonald	390 50	500 00
		County Court Clerk	"	704 20	.....
		Surrogate Registrar.....	"	1953 85	.. . ...
Kent	Chatham	Sheriff	John Mercer	3593 97	.....
		Surrogate Judge	Judge Bell	*585 00	.....
		Local Master and Deputy Registrar.....	R. O'Hara	commuted at	
		County Attorney	Wm. Douglas, Q.C...	996 59	.. ..
		Clerk of the Peace	"	1184 70	.....
		Deputy Clerk of the Crown	W. A. Campbell	156 00	450 00
		County Court Clerk.....	"	998 30	.....
		Surrogate Registrar.....	"	907 57	.....
Lambton.	Sarnia	Sheriff	Jas. Flintoft	2852 35	.....

* Commutation commenced on 1st March, 1892.

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.		Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
269 10	.....	269 10	.....	269 10	.....	110 00	159 10	.....			
736 25	1681 95	736 25	.....	736 25	1681 95	200 00	536 25	1181 95			
.....	4733 90	3198 58	1151 30	.....	4349 88	2346 57	2003 31	2387 33		4668 66	2607 66
.....	.....	.....	.....	.....	348 80	.....	348 80	348 80	*		
.....	3000 00	.....	.....	.....	3000 00	.....	.....	3000 00	*		
623 65	.....	427 08	62 00	489 08	.....	200 00	289 08	.....		567 10	420 19
1448 07	2071 72	816 36	475 08	1391 44	1880 52	300 00	1091 44	1571 72		1570 03	1268 70
1363 75	.....	1363 75	.....	1363 75	.....	325 00	1038 75	.....		1162 59	993 39
1358 47	.....	1358 47	.....	1358 47	.....	200 00	1158 47	.....		1348 93	1152 73
903 63	3625 85	903 63	.....	903 63	3625 85	200 00	703 63	2900 85		785 21	573 61
.....	3121 21	2792 51	194 83	.....	2987 34	1634 95	1352 39	1486 26		3707 32	2013 70
.....	792 00	.....	.....	.....	792 00	.....	792 00	792 00	*		
.....	1250 00	1250 00	.....	.....	1250 00	.....	.....	1250 00	*		
396 90	.....	241 30	175 00	416 30	.....	30 00	386 30	.....		595 39	564 67
1271 45	1668 35	1206 00	90 40	1296 40	1712 70	630 00	666 40	1008 35		1395 99	862 90
890 50	.....	800 50	.....	890 50	.....	450 00	440 50	.....		1100 26	830 26
704 20	.....	704 20	.....	704 20	.....	300 00	404 20	.....		926 49	710 43
1953 85	3548 55	1953 85	.....	1953 85	3548 55	248 50	1705 35	2550 05		1521 61	1191 31
.....	3593 97	2420 97	797 88	.....	3218 85	1147 49	2071 36	2446 46		4034 25	2500 82
.....	480 00	.....	.....	.....	480 00	.....	.....	480 00		447 57	447 57
.....	1600 00	1600 00	.....	.....	1600 00	.....	.....	1600 00	*		
996 59	.....	800 00	219 57	1019 57	.....	100 00	919 57	.....		1140 30	994 90
1184 70	2181 29	1184 70	175 00	1359 70	2379 27	75 00	1284 70	2006 29		1281 20	1165 20
606 00	.....	606 00	.....	606 00	.....	150 00	456 00	.....		559 20	419 30
998 30	.....	998 30	48 00	1046 30	.....	265 00	781 30	.....		759 22	415 82
907 57	2511 87	907 57	.....	907 57	2559 87	150 00	757 57	1946 87		722 53	646 39
.....	2852 35	2074 23	671 40	.....	2745 63	1065 82	1679 81	1786 53		3374 83	2041 91

*Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Lambton.—*Con.*	Sarnia	Surrogate Judge	Judge Robinson	543 50	.....
		Local Master	"	218 22	.....
		County Attorney	J. P. Bucke	784 22	.....
		Clerk of the Peace	"	1285 05	.....
		Local Registrar	W. R. Gemmill	365 21	675 00
		County Court Clerk	"	700 70	.....
		Surrogate Registrar	"	967 46	.....
Lanark	Perth	Sheriff	Jas. Thompson	1527 54	.....
		Surrogate Judge	Judge Senkler	238 50	.....
		Local Master	"	270 00	.....
		County Attorney	E. G. Malloch	389 91	.....
		Clerk of the Peace	"	590 25	.....
		Local Registrar	Charles Rice	72 21	675 00
		County Court Clerk	"	420 85	.....
		Surrogate Registrar	"	530 90	.....
Leeds and Grenville	Brockville	Sheriff	James Smart	3169 80	.....
		Surrogate Registrar	Judge Macdonald	commuted at	
		Local Master	J. D. Buell	320 40	.....
		Deputy Registrar	"	65 90	.....
		County Attorney	"	321 18	.....
		Clerk of the Peace	"	574 52	.....
		Deputy Clerk of the Crown	S. Reynolds	120 87	500 00
		County Court Clerk	"	796 78	.....
		Surrogate Registrar	"	1198 05	.....
Lennox and Addington	Napanee	Sheriff	O. T. Pruyn	1417 77	.....
		Surrogate Judge	Judge Wilkinson	commuted at	
		Local Master	S. S. Lazier	241 30	.....
		County Attorney	A. L. Morden	57 30	.....
		Clerk of the Peace	"	569 80	.....
		Local Registrar	W. P. Deroche	180 50	600 00

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
543 50	.....	543 50	.....	543 50	.....	.....	543 50	.....	458 30	458 30
218 22	761 72	216 02	.....	216 02	759 52	.....	216 02	761 72	128 29	125 84
784 22	.....	521 62	207 65	729 27	.....	17 82	711 45	.....	917 17	896 12
1285 05	2069 27	1181 15	97 80	1278 95	2008 22	.....	1278 95	2051 45	1370 69	1358 54
1040 21	.....	1040 21	.....	1040 21	.....	10 00	1030 21	.....	966 21	956 21
700 70	.....	700 70	.....	700 70	.....	15 00	685 70	.....	591 69	576 69
967 46	2708 37	967 46	.....	967 46	2708 37	20 00	947 46	2663 37	795 35	777 35
.....	1527 54	1144 03	370 24	.....	1514 27	489 15	1025 12	1038 39	1649 16	1138 99
238 50	.....	238 50	.....	238 50	.....	.....	238 50	.....	446 26	446 26
270 00	508 50	137 72	377 60	515 32	753 82	.....	515 32	508 50	344 59	393 65
389 91	.....	276 06	48 25	324 31	.....	50 00	274 31	.....	527 17	485 92
590 25	980 16	273 61	255 77	529 38	853 69	50 00	479 38	880 16	559 89	500 71
747 21	.....	747 21	23 40	770 61	.....	8 20	762 41	.....	859 42	856 42
420 85	.....	315 16	76 80	391 96	.....	16 72	375 24	.....	391 15	375 56
530 90	1698 96	446 65	119 50	566 15	1728 72	35 13	531 02	1638 91	624 14	613 04
.....	3169 80	2513 27	524 58	.....	3037 85	947 04	2090 81	2222 76	3789 75	2430 97
.....	600 00	600 00	.....	.....	600 00	.....	.....	600 00	*	
320 40	.....	250 30	184 37	434 67	.....	.....	434 67	.....	288 45	302 39
65 90	.....	20 50	45 90	66 40	.....	.....	66 40	.....	116 13	116 23
321 18	.....	246 28	101 08	347 36	.....	.....	347 36	.....	390 80	396 03
574 52	1282 00	341 31	257 29	598 60	1447 03	.....	598 60	1282 00	725 01	652 46
620 87	.....	614 07	.....	614 07	.....	14 30	599 77	.....	736 23	722 50
796 78	.....	753 78	.....	753 78	.....	11 90	741 88	.....	731 57	710 69
1198 05	2615 70	1198 05	.....	1198 05	2565 90	132 89	1065 16	2456 61		
.....	1417 77	766 95	666 21	.....	1431 16	962 97	470 19	454 80	2105 73	896 18
.....	400 00	.....	.....	.....	400 00	.....	.....	400 00	*	
241 30	.....	185 70	72 60	258 30	.....	75 00	183 30	166 30	457 08	391 48
57 30	.....	43 00	36 30	79 30	.....	10 00	69 30	.....	109 15	104 15
569 80	627 10	339 86	241 46	581 32	660 62	70 00	511 32	547 10	601 98	533 79
780 50	.....	780 50	35 50	816 00	.....	29 75	786 25	.. .. ..	867 86	857 08

*Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Lennox and Addington.—*Con* ..	Napanee	County Court Clerk.....	W. P. Deroche	338 91	.....
		Surrogate Registrar.....	"	444 40	.....
Lincoln	St. Catharines.	Sheriff	Thomas C. Dawson ..	2228 36	.....
		Surrogate Judge.....	Judge Senkler.....	commuted at	
		Local Master.	F. W. McDonald	1008 58	.....
		Deputy Registrar.....	"	247 91	.....
		County Attorney	John McKeown	375 83	....
		Clerk of the Peace.....	"	1543 12	.....
		Deputy Clerk of the Crown	J. Clench.....	468 50	450 00
		County Court Clerk	"	673 20	.....
		Surrogate Registrar	"	677 45	.....
Manitoulin.....	Gore Bay.....	District Court Clerk.....	William S. Francis ..	122 11	300 00
		Surrogate Registrar.....	" ..	64 80	.....
Middlesex.....	London	Sheriff	William Glass.....	4373 27	
		Surrogate Judge	Judge Elliott.....	commuted at	
		"	" Davis.....	.....	400 00
		Local Master.....	James Shanly	1318 18	.....
		Deputy Registrar.....	"	535 85	.....
		County Attorney	Charles Hutchison...	2141 53	.....
		Clerk of the Peace.....	" ...	1588 82	....
		Deputy Clerk of the Crown	John Macbeth.....	515 40	500 00
		County Court Clerk	"	1359 80	.....
		Surrogate Registrar.....	"	2491 30	.....
Muskoka.....	Bracebridge ...	Sheriff	James W. Bettes	1403 98	500 00
		Surrogate Judge	Judge Mahaffy	35 50	.....
		Local Master.....	"	.....	.....
		District Attorney.....	Thomas Johnson.....	410 64	.....
		Clerk of the Peace.....	"	518 58	.....
		Local Registrar	Isaac Huber.....	17 00	.....
		District Court Clerk.....	"	117 14	600 00
		Surrogate Registrar.....	"	103 05	.....

different County Judicial Officers in the Province of Ontario.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
338 91	.....	338 91	50 00	388 91	.....	16 00	372 91	.....	395 95	395 59
444 40	1563 81	444 40	10 50	454 90	1659 81	30 56	424 34	1487 50	412 10	403 75
.....	2228 36	1650 04	376 26	.....	2026 30	588 70	1437 60	1637 66	2455 90	1707 49
.....	556 00	566 00	.....	.....	566 00	.....	.....	566 00	†	
1008 58	.....	410 62	475 18	885 80	.....	30 00	855 80	.....	866 98	825 45
247 91	1256 49	49 80	159 48	209 28	1095 08	.....	209 28	1226 49	301 07	309 34
375 83	.....	375 83	.....	375 83	.....	46 00	329 83	.....	317 87	272 19
1543 12	1918 95	1543 12	.....	1543 12	1918 83	349 19	1193 93	1523 76	1267 43	1033 73
918 50	.....	912 54	128 90	1041 44	.....	51 46	989 98	.....	792 29	793 90
673 20	....	588 34	89 80	678 14	....	5 26	672 88	.....	532 84	523 82
677 45	2269 15	645 38	4 90	650 28	2369 86	20 91	629 37	2191 52	664 86	632 96
422 11	.....	422 11	.....	422 11	.....	26 00	396 11	.....	*	
64 80	486 91	64 80	.....	64 80	486 91	.....	64 80	460 91	*	
.....	4373 27	4213 19	381 46	.....	4594 65	2113 12	2481 53	2260 15	4679 21	2439 06
.....	1000 00	1000 00	.....	.....	1000 00	.....	.. ..	1000 00	†	
.....	400 00	400 00	.....	.....	400 00	....	.....	400 00	*	
1318 18	.....	194 70	122 75	317 45	.....	59 62	257 93	.....	1040 46	759 29
535 85	1854 03	535 85	.....	535 85	853 30	.....	525 85	1794 51	635 48	618 97
2141 53	.....	1814 57	635 32	2449 89	.....	400 25	2049 64	....	2310 44	1881 45
1588 82	3730 35	965 42	663 95	1629 37	4079 26	385 96	1243 41	2944 14	1807 86	1345 74
1015 40	....	910 70	20 80	931 50	.....	396 00	535 50	.....		
1359 80	.....	1313 10	9 10	1322 20	.....	396 00	926 20	....	1740 86	1374 54
2491 30	4866 50	2460 70	.....	2460 70	4714 40	396 00	2064 70	3678 50		
.....	1903 98	1371 13	438 88	.....	1810 01	629 69	1180 32	1274 29	*	
35 50	... ..	35 50	.....	35 50	... .	.....	35 50	.....	*	
.....	35 50	.. ..	.....	.....	35 50	.....	.....	35 50	*	
410 64	.....	235 94	112 00	347 94	.....	.....	347 94	.....	*	
518 58	929 22	256 43	203 80	460 23	808 17	59 58	400 65	869 64	*	
17 00	.....	17 00	.....	17 00	....	2 75	14 25	..... .	*	
717 14	.....	717 14	.....	717 14	.....	4 25	712 89	.....	*	
103 05	837 19	103 05	.. ..	103 05	837 19	4 62	98 43	825 57	*	

* Not five years in office. † Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Norfolk	Simcoe	Sheriff	*E. Deedes	1766 11	
		Surrogate Judge	Jugde Robb	609 70	
		County Attorney	J. H. Ansley	199 90	
		Clerk of the Peace	"	930 42	
		Local Master	C. C. Rapelje	171 40	
		Local Registrar	"	197 80	675 00
		County Court Clerk	"	476 18	
		Surrogate Registrar	"	812 60	
Northumberland & Durham	Cobourg	Sheriff	I. O. Proctor	3379 97	
		Surrogate Judge	Judge Benson	commuted at	
		Local Master	J. H. Dumble	513 66	
		County Attorney	J. W. Kerr	663 20	
		Clerk of the Peace	"	881 71	
		Local Registrar	John Fisher	318 00	750 00
		County Court Clerk	"	933 88	
		Surrogate Registrar	"	1369 88	
Ontario	Whitby	Sheriff	J. F. Paxton	2461 78	
		Surrogate Judge	Judge Burnham	commuted at	
		Local Master	Judge Dartnell	336 90	
		County Attorney	J. E. Farewell, Q.C.	502 41	
		Clerk of the Peace	"	1084 83	
		Local Registrar	L. T. Barclay	125 80	675 00
		County Court Clerk	"	693 55	
		Surrogate Registrar	"	1027 00	
Oxford	Woodstock	Sheriff	James Brady	3032 08	
		Surrogate Judge	Judge Finkle	762 80	
		Local Master	H. B. Beard, Q.C.	349 61	
		Deputy Registrar	"	315 03	
		County Attorney	F. R. Ball, Q.C.	367 80	
		Clerk of the Peace	"	895 19	

* Succeeded by Joseph Jackson, 1st September.

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.		Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these year.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
.....	1766 11	1009 84	646 79	.....	1656 63	1071 27	585 36	694 84		2480 33	1258 61
.....	609 70	609 70	.....	.....	609 70	.....	.....	609 70	*		
199 90	.....	199 90	.....	199 90	.....	47 40	152 50	.....		336 40	352 54
930 42	1130 32	926 67	.....	926 67	1126 57	22 19	904 48	1060 73		980 95	960 29
171 40	.....	170 49	9 04	179 53	.....	18 05	161 48	... .		237 58	235 79
872 80	.....	794 23	3 00	797 23	.....	21 93	775 30	.....		810 05	790 20
476 18	.....	424 81	123 71	548 52	.....	1 25	547 27	....		477 03	486 28
812 60	2332 98	556 45	146 85	703 30	2228 58	18 05	685 25	2273 70		672 98	643 01
.....	3379 97	2220 92	921 88	.....	3142 80	2103 13	1039 67	1276 84		4488 38	2131 81
.....	840 00	.....	.....	840 00	.....	.....	.....	840 00	†		
.....	513 66	306 37	293 24	.....	593 61	10 00	583 61	503 66		881 36	601 10
663 20	.....	381 66	191 20	572 86	.....	100 00	472 86	.....		819 75	657 68
881 71	1544 91	424 94	327 51	752 45	1325 31	200 00	552 45	1244 91		1054 42	810 35
1068 00	.....	954 70	14 10	968 80	.....	200 00	768 80	.....		1113 04	906 60
933 88	.....	844 28	273 19	1117 47	.....	270 00	847 47	.....		882 75	621 01
1369 88	3371 76	1253 88	309 89	1563 77	3650 04	200 00	1363 77	2701 76		1352 06	1238 57
.....	2461 78	1731 71	525 49	.....	2257 20	1073 53	1183 67	1388 25		2820 72	1326 92
.....	540 00	540 00	.....	.....	540 00	.....	.....	540 00	†		
.....	336 90	.....	....	.....	336 90	10 00	326 90	326 90		434 84	408 84
502 41	.....	422 35	116 90	539 25	....	141 50	397 75	....		704 39	553 03
1084 83	1587 24	613 30	462 78	1076 08	1615 33	269 02	807 06	1176 72		1300 50	1006 67
800 80	.....	800 80	.....	800 80	.....	12 00	788 80	.....		844 80	832 90
693 55	.....	688 75	7 80	696 55	.....	10 00	686 55	.....		686 19	676 50
1027 00	2521 35	1025 00	.....	1025 00	2522 35	102 00	923 00	2397 35		926 19	874 89
.....	3032 08	2731 41	195 27	.....	2926 68	931 12	1995 56	2100 96	*		
.....	762 80	.....	.....	.....	762 80	.....	.....	762 80		732 86	732 86
349 61	.....	349 61	.....	349 61	.....	.....	349 61	.....		392 57	392 57
315 03	664 64	315 03	.....	315 03	664 64	.....	315 03	664 64		308 48	308 48
367 80	.....	225 80	118 60	344 40	.....	14 00	330 40	.....		373 26	351 98
895 19	1262 99	286 16	521 29	807 45	1151 85	7 50	799 95	1241 49		860 97	835 69

* Not five years in office. † Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Offices.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Oxford.—*Con*.....	Woodstock	Deputy Clerk of the Crown	James Canfield	448 30	450 00
		County Court Clerk	"	814 28	.....
		Surrogate Registrar	"	1275 70	.....
Parry Sound	Parry Sound ..	Sheriff	Henry Armstrong ...	1143 94	500 00
		Surrogate Judge.....	Judge Mahaffy.....	23 50	....
		Local Master	See under Muskoka.		
		District Attorney			
		Clerk of the Peace.....			
		Local Registrar	R. H. Stewart	6 00	600 00
		District County Clerk	"	12 90	.....
		Surrogate Registrar	"	58 70	.....
Peel	Brampton	Sheriff	Robert Broddy	2626 95	.....
		Surrogate Judge	Judge Scott	commuted at	
		Local Master	"	.....	.....
		County Attorney	W. H. McFadden ...	252 10	.....
		Clerk of the Peace.....	" ...	1074 33	.....
		Local Registrar	J. A. Austin.....	146 94	600 00
		County Court Clerk	"	375 49	.....
		Surrogate Registrar	"	692 38	....
Perth	Stratford.....	Sheriff	John Hossie	2486 80	.... ..
		Surrogate Judge..	Judge Woods.....	971 40	. .....
		Local Master	John E. Harding, Q.C.	1408 08	.....
		County Attorney	John Idington, Q.C..	431 40	.....
		Clerk of the Peace.....	" ..	752 42	.....
		Local Registrar	Jas. McFadden.....	796 75	675 00
		County Court Clerk	"	619 65	.....
		Surrogate Registrar	"	1255 60	.....
Peterborough	Peterborough..	Sheriff	Jas. A. Hall	2247 17	. .. ...
		Surrogate Judge.....	Judge Weller..... ..	469 00	.....

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.		Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
898 30	.....	675 70	120 00	795 70	.....	177 60	618 10	.....		990 42	888 77
814 28	.....	620 50	195 00	815 50	.....	59 80	755 70	.....		806 48	782 00
1275 70	2988 28	893 50	231 00	1124 50	2735 70	75 87	1048 63	2675 01		1300 08	1196 24
.....	1643 94	1290 11	300 36	.....	1590 47	480 13	1110 34	1123 77	*		
.....	23 50	.....	.....	.....	23 50	.....	23 50	23 50	*		
606 00	.....	606 00	.....	606 00	.....	3 00	603 00	.....	*		
12 90	.....	12 90	.....	12 90	.....	.....	12 90	.....	*		
58 70	677 60	58 70	.....	58 70	677 60	.....	58 70	674 70	*		
.....	2626 95	2296 21	243 67	.....	2539 88	1465 99	1073 89	1160 96		2503 11	1152 01
240 00	.....	240 00	.....	240 00	.....	.....	240 00	.....	†		
.....	.....	.....	.....	.....	.....	.....	.....	.....			
252 10	.....	215 10	93 00	308 10	.....	20 00	288 10	.....		281 34	278 54
1074 33	1326 43	829 51	105 82	935 33	1243 43	30 00	905 33	1276 43		960 34	916 54
746 94	.....	746 94	.....	746 94	.....	29 46	717 48	.....		743 07	712 19
375 49	.....	351 26	12 30	363 56	.....	8 05	356 51	.....		344 37	334 17
692 38	1814 81	663 73	14 70	678 43	1788 93	28 98	649 45	1748 32		695 69	669 39
.....	2486 80	1871 85	675 55	.....	2547 40	1132 49	1414 91	1354 31		3182 86	1926 61
971 40	.....	971 40	.....	971 40	.....	.....	971 40	971 40		737 06	737 06
1408 08	.....	1255 53	148 85	.....	1404 38	.....	1404 38	1408 08	*		
431 40	.....	292 60	120 00	412 60	.....	10 00	402 60	.....		524 49	497 54
752 42	1183 82	424 89	324 95	749 84	1162 44	260 13	489 71	913 69		709 11	450 81
1471 75	.....	1471 75	128 75	1600 50	.....	473 63	1126 87	.....		1434 17	1189 87
619 65	.....	619 65	115 20	734 85	.....	300 00	434 85	.....		666 66	493 46
1255 60	3347 00	1253 20	.....	1253 20	3588 55	200 00	1053 20	2373 37		1107 98	937 50
.....	2247 17	2134 45	145 79	.....	2280 24	624 65	1655 59	1622 52		2295 92	1819 81
469 00	.....	469 00	.....	469 00	.....	.....	469 00	.....		441 90	441 90

*Not five years in office. †Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officers.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Peterboro—*Con* ..	Peterboro'. ...	Local Master.....	Judge Weller.....	305 80	.. ..
		County Attorney	Robert E. Wood.....	374 50	.....
		Clerk of the Peace.....	"	847 55	.....
		Local Registrar.....	John Maloney.....	511 46	675 00
		County Court Clerk....	"	563 05	..... .
		Surrogate Registrar....	"	630 02	..... .
Prescott & Russell	L'Orignal.....	Sheriff	Albert Hagar.....	1974 75	500 00
		Surrogate Judge.....	Judge O'Brian.....	112 00	.....
		Local Master.....	"	56 40	.....
		County Attorney.....	John Maxwell.....	253 71	.....
		Clerk of the Peace.....	"	920 97	.....
		Local Registrar.....	John Fraser	137 10	675 00
		County Court Clerk....	"	294 17	.....
		Surrogate Registrar....	"	289 13	.....
Prince Edward...	Picton.....	Sheriff.	Jas. Gillespie.....	1425 29	200 00
		Surrogate Judge.....	Judge Merrill.....	214 50	.....
		Local Master.....	Nehemiah Gilbert.....	390 14	.....
		County Attorney.....*	J. Roland Brown	43 34	....
		Clerk of the Peace	"	426 40	.. ... .
		Local Registrar	John Twigg.....	114 00	600 00
		County Court Clerk....	"	365 85	.....
		Surrogate Registrar....	"	400 80	.....
Rainy River.....	Rat Portage...	Sheriff..... ...	Wm. H. Carpenter.....	813 61	1000 00
		Surrogate Judge.....	Judge Hamilton.....	15 00	.....
		Local Master.....	See under Thunder Bay.		
		District Attorney.....			
		Clerk of the Peace.....			
		District Court Clerk...	Frank J. Apjohn.....	180 95	700 00
		Surrogate Registrar...	"	48 55	.....

* From Aug. 5.

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.		Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
305 80	774 80	.....	.....	.....	774 80	.....	305 80	774 80		380 79	380 79
374 50	.....	211 50	92 40	303 90	.....	9 50	294 40	.....		295 50	274 07
847 55	1222 05	360 47	406 67	767 14	1071 04	21 00	746 14	1191 55		843 42	805 00
1186 46	.....	1149 56	.....	1149 56	.....	90 00	1059 56	.....		984 27	900 27
563 05	.....	490 45	.....	490 45	.....	75 00	415 45	.....		535 63	457 63
630 02	2379 53	630 02	.....	630 02	2270 03	80 00	550 02	2134 53		568 24	496 24
.....	2474 75	1913 57	466 33	.....	2379 90	845 04	1534 86	1629 71		2870 55	2015 16
112 00	.....	112 00	.....	112 00	.....	.....	112 00	.....	*		
56 40	168 40	50 00	2 00	52 00	164 00	.....	52 00	168 40	*		
253 71	.....	233 71	.....	233 71	.....	40 00	193 71	.....		202 54	161 14
920 97	1174 68	885 97	.....	885 97	1119 68	21 00	864 97	1113 78		813 97	787 37
812 10	.....	796 70	.....	796 70	.....	.....	796 70	.....		798 85	772 46
294 17	.....	268 20	19 20	287 40	.....	.....	287 40	.....		316 64	296 08
289 13	1395 40	281 58	25 61	307 19	1391 79	.....	307 19	1395 40		331 72	261 07
.....	1625 29	1217 44	364 06	.....	1581 50	947 20	634 30	678 09		1705 49	774 24
.....	214 50	.....	.....	.....	214 50	.....	.....	214 50	*		
.....	390 14	210 28	49 91	.....	260 19	15 00	245 19	375 14	*		
43 34	.....	20 94	.....	20 94	.....	6 00	14 94	.....	*		
426 40	469 74	179 33	.....	179 33	200 27	19 53	159 80	444 21	*		
714 00	.....	714 00	.....	714 00	.....	.....	714 00	.....		734 84	734 84
365 85	.....	318 30	49 25	367 55	.....	.....	367 55	.....		420 28	426 62
400 80	1480 65	398 70	13 55	412 25	1493 80	.....	412 25	1480 65		399 80	402 49
.....	1813 61	1640 48	274 42	.....	1914 90	276 42	1638 48	1537 19		1740 91	1403 97
.....	15 00	.....	.....	.....	15 00	.....	.....	15 00	*		
880 95	.....	880 95	.....	880 95	.....	.....	880 95	.....		736 08	736 08
48 55	929 50	48 55	.....	48 55	929 50	.....	48 55	929 50			

*Not five years in office.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officers.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Renfrew	Pembroke	Sheriff	Wm. Moffatt	2480 34	
		Surrogate Judge	Judge Deacon	commuted at	
		Local Master	"	114 10	
		County Attorney	J. H. Metcalf	259 70	
		Clerk of the Peace	"	818 54	
		Local Registrar	A. Thomson	37 05	600 00
		County Court Clerk	"	479 64	
		Surrogate Registrar	"	502 20	
Simcoe	Barrie	Sheriff	O. J. Phelps	4357 51	
		Surrogate Judge	Judge Ardagh	commuted at	
		Local Master	J. R. Cotter	764 40	
		Deputy Registrar	"	680 05	
		County Attorney	"	718 00	
		Clerk of the Peace	"	1181 06	
		Deputy Clerk of the Crown	J. McL. Stevenson	486 65	500 00
		County Court Clerk	"	1284 77	
		Surrogate Registrar	"	1211 15	
Stormont, Dundas and Glengarry	Cornwall	Sheriff	D. E. McIntyre	3068 06	
		Surrogate Judge	Judge Pringle	490 00	
		Local Master	"	644 30	
		County Attorney	James Dingwall	203 90	
		Clerk of the Peace	"	608 91	
		Local Registrar	J. A. McDougald	552 70	750 00
		County Court Clerk	"	887 45	
		Surrogate Registrar	*Miss Helen McDonald	810 43	
Thunder Bay	Port Arthur	Sheriff	Alex. W. Thompson	1863 83	800 00
		Surrogate Judge	Judge Hamilton	19 50	
		Local Master	"	398 90	
		District Attorney	†A. R. Lewis, Q. C.	177 96	
		Clerk of the Peace	"	346 06	

* Appointed June, 1892. † Succeeded by Thos. A. Gorham, Oct. 29th.

different County Judicial Officers in the Province of Ontario, Etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.	$ c.
.....	2480 34	2293 45	6 48	.....	2299 93	967 14	1332 79	1513 20	‡		
264 00	.....	264 00	.....	264 00	.....	.....	264 00	.....	†		
114 10	380 10	114 10	.....	114 10	380 10	.....	114 10	380 10		129 31	128 49
259 70	.....	233 20	29 50	262 70	.....	8 00	254 70	.....		268 19	256 63
818 54	1078 24	463 53	244 88	708 41	971 11	21 09	687 32	1057 15		803 85	713 59
637 05	.....	637 05	.....	637 05	.....	3 00	634 05	.....		660 33	654 23
479 64	.....	479 64	.....	479 64	.....	6 00	473 64	....		434 43	427 53
502 20	1618 89	502 20	.....	502 20	1618 89	10 00	492 20	1599 89		358 73	339 31
.....	4357 51	4037 72	400 98	.....	4438 70	2880 28	1558 42	1477 23	‡		
.....	585 00	.....	.....	.....	585 00	.....	585 00	585 00	†		
764 40	.....	.....	.....	764 40	.....	.....	764 40	.....		833 10	812 30
680 05	.. ..	680 05	.....	680 05	.....	58 50	621 55	....		685 06	637 76
718 00	.....	718 00	.. ....	718 00	.....	13 00	705 00	.....		887 13	872 92
1181 06	3343 51	1181 06	.....	1181 06	3343 51	26 00	1155 06	3246 01		1387 56	1305 47
986 65	.....	986 65	.....	986 65	.....	135 00	851 65	.....		1080 56	940 60
1284 77	....	1284 77	.....	1284 77	.....	190 00	1094 77	....		1358 81	1160 16
1211 15	3482 57	1211 15	.....	1211 15	3482 57	165 00	1046 15	2992 57		1231 55	1048 86
.....	3068 06	2569 60	581 05	.. ..:.	3150 65	1111 55	2039 10	1956 51		3461 91	2412 76
490 00	.....	490 00	.....	490 00	.....	.....	490 00	.....		390 20	390 20
644 30	1134 30	585 03	106 35	691 38	1181 38	28 91	662 47	1105 39		1077 15	1057 60
203 90	.....	172 60	54 00	226 60	.....	23 00	203 60	... .		406 07	381 56
608 91	812 81	583 70	242 41	826 11	1052 71	18 50	807 61	771 31		727 99	734 62
1302 70	.....	1302 70	15 00	1317 70	.....	206 35	1111 35	.....	‡		
887 45	2190 15	887 45	205 50	1092 95	2410 65	15 90	1077 05	1967 90	‡		
.....	810 43	809 43	24 20	.....	833 63	2 00	831 63	808 43	‡		
..... .	2663 83	2281 48	265 36	.....	2546 84	566 86	1979 98	2096 97	‡		
19 50	.....	.....	.....	19 50	.....	.....	19 50	.....		19 60	19 66
398 90	418 40	398 90	.....	398 90	418 40	20 20	378 70	398 20		147 25	137 27
177 96	.....	173 60	....	173 60	.....	28 36	149 60	..... .		194 42	180 95
346 06	524 02	524 01	.....	342 01	515 61	138 25	203 76	357 41		337 52	303 46

†Commuted on average of previous five years. ‡ Not five years in office.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officers.	Amount earned.	Salary paid by the Government.
				$ c.	$ c.
Thunder Bay-*Con.*	Port Arthur....	Local Registrar.....	James Meek	210 68	600 00
		District Court Clerk.....	"	351 57	.....
		Surrogate Registrar.....	"	80 13	.....
Victoria.....	Lindsay.....	Sheriff	John McLennan.....	2337 64	.....
		Surrogate Judge...	Judge Dean..... . ..	commuted at	
		Local Master.....	† "	commuted at	
		County Attorney	A. P. Devlin.....	346 13	.....
		Clerk of the Peace.	"	1044 38	.....
		Local Registrar.....	William Grace... ..	382 20	675 00
		County Court Clerk.....	"	641 79	.....
		Surrogate Registrar.....	"	513 46	.....
Waterloo.....	Berlin....	Sheriff	Moses Springer.....	2508 50	100 00
		Surrogate Judge..... ..	Judge Lacourse.....	commuted at	
		Local Master.....	"	commuted at	
		County Attorney	W. H. Bowlby, Q. C.	511 00	.....
		Clerk of the Peace.....	"	1219 30	.....
		Local Registrar....	John McDougall	495 04	1075 00
		County Court Clerk.....	"	440 80	.....
		Surrogate Registrar	A. J. Peterson.....	1171 82	.....
Welland.....	Welland.....	Sheriff	James Smith	2394 79	.....
		Surrogate Judge.....	Judge Baxter	‡401 70	.....
		Local Master	"	221 53	.....
		County Attorney	T. D. Cowper	403 93	. .....
		Clerk of the Peace.....	"	776 89	.....
		Local Registrar....	I. P. Wilson.....	205 20	600 00
		County Court Clerk.....	"	528 45	.....
		Surrogate Registrar.....	"	985 55	.....
Wellington. ...	Guelph...	Sheriff	R. McKim	2845 44	. .....
		Surrogate Judge.....	Judge Chadwick	857 70	.. .. ..

‡ Commuted from 1st June.

† John McSweyn appointed 22nd October *pro tem.*

different County Judicial Officers in the Province of Ontario, etc.—*Continued.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
810 68	.....	807 13	29 30	836 43	.....	5 00	831 43	.....	*	
351 57	.....	321 22	102 06	423 28	.....	.....	423 28	.....	*	
80 13	1242 38	67 17	.....	67 17	1326 88	.....	67 17	1737 38	*	
.....	2337 64	1713 87	403 62	.....	2117 49	565 70	1551 79	1771 94	2642 02	1972 72
500 00	.....	500 00	.....	500 00	.....	.....	500 00	.....	†	
900 00	1400 00	900 00	.....	900 00	1400 00	.....	900 00	1400 00	†	
346 13	.....	327 48	193 04	520 52	.....	.....	520 52	.....	363 79	390 96
1944 38	1390 51	995 30	353 70	1349 00	1869 52	.....	1349 00	1390 51	990 75	1033 87
1057 20	.....	975 00	45 60	1020 60	.....	50 00	970 60	.....	925 43	882 11
641 79	.....	400 00	100 00	500 00	.....	20 00	480 00	.....	532 83	489 47
513 46	2212 45	513 46	41 00	554 46	2075 06	41 00	513 46	2101 45	418 59	412 59
.....	2608 50	2561 04	238 57	.....	2799 61	930 12	1869 49	1678 38	2957 94	1712 11
704 00	.....	.....	.....	704 00	.....	.....	704 00	.....	†	
591 00	1295 00	.....	.....	591 00	1295 00	.....	591 00	1295 00	†	
511 00	.....	511 00	94 50	605 50	.....	100 00	505 50	.....	608 91	524 41
1219 30	1730 30	1219 30	50 20	1269 30	1874 80	300 00	969 30	1330 30	1243 06	933 07
1570 04	.....	1570 04	.....	1570 04	.....	150 00	1420 04	.....	1430 01	1343 00
440 80	2010 84	440 80	.....	440 80	2010 84	.....	440 80	1860 84	410 34	355 34
.....	.....	1171 82	.....	.....	1171 82	232 00	939 82	939 82	1051 45	895 32
.....	2394 79	1934 48	531 09	.....	2465 57	704 90	1755 67	1689 89	*	
401 70	.....	401 70	.....	401 70	.....	.....	401 70	.....	†	
221 53	623 23	221 53	.....	221 53	623 23	.....	221 53	623 23	171 77	168 57
403 93	.....	293 04	.....	293 04	.....	74 69	218 35	.....	*	
776 89	1180 82	449 39	.....	449 39	742 43	20 00	2129 39	1086 13	*	
805 20	.....	768 60	40 20	808 80	.....	68 36	740 44	.....	1120 66	1076 46
528 45	.....	497 25	21 05	518 30	.....	59 33	458 97	.....	435 54	407 45
985 55	2319 20	978 17	.....	978 17	2305 27	200 00	778 17	1991 51	*	
.....	2845 44	1796 90	626 92	.....	2603 82	1554 90	1048 92	1290 54	3071 12	1377 94
.....	857 70	.....	.....	.....	857 70	.....	.....	857 70	*	

* Not five years in office. † Commuted on average of previous five years.

APPENDIX F.—Schedule shewing Return of Fees and Emoluments of the

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Wellington—*Con.*	Guelph	Local Master	A. M. McKinnon	1249 22	.....
		Deputy Registrar	"	316 92	.....
		County Attorney	H. W. Peterson	671 21	.....
		Clerk of the Peace	"	2240 25	.....
		Deputy Clerk of the Crown	James Hough	128 38	500 00
		County Court Clerk	"	671 00	.....
		Surrogate Registrar	Alex. Mackenzie	1763 70	.....
Wentworth	Hamilton	Sheriff	Hon. A. McKellar	5593 12	.....
		Surrogate Judge	Vacant	1000 00	.....
		Local Master and Deputy Registrar	J. E. O'Reilly	commuted at	
		County Attorney	John Crerar	1363 64	.....
		Clerk of the Peace	"	1152 80	.....
		Deputy Clerk of the Crown	S. H. Ghent	455 17	500 00
		County Court Clerk	"	1504 76	.....
		Surrogate Registrar	"	1884 93	.....
York	Toronto	Sheriff	J. H. Widdifield	9118 29	.....
		Surrogate Judge	Judge McDougall	2990 50	.....
		"	Judge Morgan	.....	666 00
		"	Judge Morson	.....	666 00
		County Attorney	*G. W. Badgerow	6663 91	.....
		Clerk of the Peace	J. H. Bull	4160 10	.....
		Surrogate Registrar	T. G. Brown	5047 09	.....
		County Court Clerk	Hon. A. M. Ross	6586 05	.....
Toronto	Toronto	Sheriff	Fred. Mowat	17566 10	.....

* Succeeded by H. H. Dewart, August 6th.

different County Judicial Officers in the Province of Ontario, etc.—*Concluded.*

Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Average of gross earnings for years 1888 to 1892, both inclusive.	Average of net amount due to or received by officer during these years.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1249 22	.....	1017 26	230 38	1247 64	.....	65 00	1182 64	.....	1327 52	1250 37
316 92	1566 14	256 80	76 25	333 05	1580 69	10 50	322 55	1489 64	293 27	288 23
671 21	.....	537 21	169 00	706 21	.....	50 00	656 21	.....	702 94	591 04
2240 25	2911 46	1540 96	714 75	2255 71	2961 92	100 00	2155 71	2761 46	2321 17	1922 06
628 38	.....	628 38	.....	628 38	.....	.....	628 38	.....	607 66	607 48
671 00	1299 38	644 90	4 40	649 30	1277 68	524 00	125 30	775 38	845 96	423 55
.....	.....	1763 70	40 50	1804 20	.....	110 00	1694 20	1653 70	1382 41	1312 11
.....	5593 12	4537 49	851 87	.....	5389 36	3406 20	1983 16	2186 92	5690 02	2574 25
.....	1000 00	.....	.....	.....	1000 00	.....	.....	1000 00	.....	.....
.....	3500 00	.....	.....	.....	3500 00	.....	.....	3500 00 †	.....	.....
1363 64	.....	1363 64	.....	1363 64	.....	.....	1363 64	.....	1453 65	1442 11
1152 80	2516 14	1152 80	.....	1152 80	2516 14	300 00	852 80	2216 14	1242 73	1031 89
955 17	.....	923 17	12 00	935 17	.....	.....	935 17	.....	992 65	964 47
1504 76	.....	1377 34	192 34	1569 68	.....	265 20	1304 48	.....	1512 69	1280 30
1884 93	4344 86	1814 53	17 65	1832 18	4337 03	318 00	1514 18	3761 66	1695 80	1440 16
.....	9118 29	†6944 94	1412 25	.....	8357 19	5083 55	3274 64	4034 74 *	.....	.....
.....	2990 50	.....	.....	.....	2990 50	.....	.....	2990 50	2652 32	2652 32
.....	666 00	666 00	.....	.....	666 00	.....	.....	666 00	666 00	666 00
.....	666 00	.....	.....	.....	666 00	.....	.....	660 00	.....	.....
.....	6663 91	5780 62	508 20	.....	6288 92	788 38	5500 44	5875 53	5698 73	4452 41
.....	4160 10	3739 35	240 30	.....	3979 85	822 00	3157 85	3338 10	3569 72	2913 04
.....	5047 09	5035 09	39 20	5074 29	.....	874 63	4199 66	4172 46	4556 69	3957 41
.....	6586 05	6487 30	36 55	6523 85	.....	1742 11	4781 74	4843 94 *	.....	*.....
.....	17566 10	14570 27	2333 00	.....	16903 27	9149 36	7754 91	8416 74	17957 68	8341 20

*Not five years in office. †Commuted on average of previous five years.

ELEVENTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

OF ONTARIO

BEING FOR THE YEAR

1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO
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1893.

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TENTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

To the Honorable GEORGE AIREY KIRKPATRICK, *Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOR:

It has been a source of great pleasure to everyone that Asiatic cholera, which was introduced by European immigrants into New York City in the month of August, 1892, was so efficiently controlled by the local sanitary authorities that no fresh centres of infection occurred, and that the disease was prevented from spreading on this continent. Since last summer, however, the people generally of this Province, and boards of health particularly, have been much occupied with the consideration of its possible advent among us during the hot weather of 1893.

In order to ascertain the best methods of preventing the entrance of this terrible plague into our country, and among other things, to establish the relations between Dominion and Provincial sanitation, a Conference consisting of representatives from the provincial governments, was officially called by the Minister of Agriculture, and met on January 31st, 1893, at Ottawa. A full report of the proceedings of the Conference will be found in Part II of this Report.

The Provincial Board of Health of Ontario has also, as Your Honor is aware, adopted special Regulations designed to prevent the entrance of cholera into Ontario, and more especially to stamp it out should it appear in any of our municipalities. The full text of these Regulations, dated the 11th day of April, 1893, has already been published and distributed to Local Boards of Health.

A circular has also been issued by this Board, giving advice to the public, for the restriction and prevention of cholera.

A still more important work has been the preparation of Pamphlet No. 1, 1893, or "Rules for checking the spread of contagious or infectious diseases, and hints on methods for dealing with municipal and house wastes." This pamphlet is probably the most important which has so far been issued by this Board. It deals with the salient features of private and municipal hygiene, and is intended to be a *vade mecum* to sanitary inspectors, and a work of ready reference for municipal boards of health. While some of the rules and regulations, which it contains, refer specially to the prevention of cholera, many also apply to such diseases as diphtheria, typhoid fever, scarlet-fever and measles, some of which unfortunately prevail in different parts of the Province every year.

A perusal of the reports of medical health officers of cities in Ontario shows, that in all the cities the sanitary condition of the inhabitants is good, and that in some distinct

advances have been made in preventing sickness and lowering the death rate. This fact is very distinctly brought out in the report of Dr. Griffin, Medical Health Officer, of Brantford. In this gentleman's opinion it is established beyond any doubt, that the most potent factor in the causation of typhoid fever, is impure water, and that attacks of typhoid fever in Brantford were brought on by the use of impure well water. Dr. Griffin also reports, that of the fifty-five cases of typhoid fever, which occurred in Brantford during 1892, since the introduction of a pure public water supply, only seven could be ascribed to emanations from foul unventilated drains or soak-pits, the other forty-eight being traceable to the use of impure, unboiled well water.

In St. Thomas, also, where, as Dr. VanBuskirk, the Medical Health Officer observes, typhoid fever used to be of common occurrence, it has now almost disappeared. This happy condition of affairs has been brought about by the disuse of private wells and the introduction into St. Thomas of filtered water, which in addition to supplying domestic wants, is also employed in flushing the eight miles of brick and tile sewers which that city possesses.

In the reports from the cities of Ontario we also read of demands for the abolition of privy pits, the removal or renovation of old sewers and the introduction of new ones. Improved systems of scavenging and disposal of garbage and excreta, the systematic application of steam as a disinfecting agent, and the more general use of isolation hospitals are also receiving attention from municipal health authorities.

The ready reception accorded to improved methods of heating and ventilating houses by the people of this Province, their efforts to obtain the best sanitary conveniences in their houses, and the co-operative energy displayed by them in assisting the health authorities to put down infectious diseases, are all evidence of the fact that the efforts of this Board and of the Local Boards of Health to restrict disease and decrease some of the worse discomforts of life, are receiving a hearty appreciation from an intelligent and reflective people. There can be no doubt, also, that owing to the general diffusion of education among the people and the teaching of hygiene in the public schools, the abolition of the cruder sanitary methods and the introduction of modern sanitary conveniences will be more generally demanded.

In addition to ordinary work, this Board has sent a sanitary exhibit to the World's Fair at Chicago. To visiting sanitarians from all portions of the world, it will serve as an indication of productive vigor in health work in this country, while to the general public it will show that the premier province of the Dominion wisely watches over the health as well as the wealth and commercial prosperity of her children.

There are at present 592 Local Boards of Health, and of these 365 have appointed Medical Health Officers.

Trusting that the already favorable health conditions of the Province may continue to improve, and that the now thoroughly aroused vigilance of Local Boards of Health may not be too easily lulled into a condition of false security,

I have the honor to remain,

Your obedient servant,

JNO. J. CASSIDY,
Chairman.

PART I.

REPORT OF THE SECRETARY.

CHAPTER I.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—In referring to the chief features which have marked the Board's work during the year, I find that they are especially characterized by the details of executive work which seem to be increasing from year to year, and in some ways taking precedence of the work of disseminating sanitary information which formed so large a part of the work in the earlier years of the Board's organization. It cannot be said, however, that the latter work was neglected during the year, as the Board published, in addition to the dissemination of many copies of the Public Health Act and of the pamphlet on "How to Check Contagious Diseases," a large edition of the "Advice to the Public on Cholera" and "The Annual Report of the Association of Executive Health Officers of Ontario."

The addition of the Laboratory to the equipment of the Board has been a great aid to its executive work, as by it the examination of public water and ice supplies, of the investigation of specimens of diseased tissues of animals, and the bacteriological investigations of suspected contagious diseases of men and animals have enabled the Board to draw accurate conclusions and give authoritative opinions with regard to the many matters brought before it for consideration by Local Boards of Health, which have been of the greatest value in advancing the work laid upon the Board by the Public Health Act and the various amendments thereto.

The appointment by the Government of your Secretary to the position of Deputy-Registrar-General has by bringing the Registration of Births, Marriages and Deaths into close relation with the work of the Board likewise further consolidated, extended and broadened the work of Public Health in Ontario.

The study of the Vital Statistics of the Province as they yearly become more accurate and scientific becomes of much importance to the work of the Board, as thereby attention is drawn to the prevalence of certain classes of disease, and as a result enquiry into the causes which lie behind such prevalence most naturally follows.

While it cannot be said that either the work of the Provincial Board or of the Local Boards of the Province has attained that degree of efficiency which is the dream of every enthusiastic sanitarian, yet when a comparison is instituted between the sanitary status of Ontario and that of any other Province or State on the continent, the Board may well be gratified in feeling that the work of ten years has not been in vain. This cannot be better illustrated than by a reference to the diagrams setting forth the relative prevalence of contagious disease in the Province during the past ten years, and to various tables in the Report of the Registrar General, which indicate the decreasing death-rate per 1,000 in different cities of the Province. The extension of the work of the Board and the widening interest and influence of public health is further noticeable in the close relationships being yearly established between not only the Provincial Board and Local Boards, but between them and sanitary engineers, public school inspectors, veterinary surgeons and those engaged in the various branches of scientific agriculture. Waterworks and sewerage schemes, the investigation of outbreaks of disease in animals, diseases among insects as

the "flour moth" pest and foul brood in bees, parasitic diseases in sheep and horses, the ventilation and construction of schools and factories, and many other problems have increasingly engaged the Board's attention; and viewing at the close of a year's work the Board's operations, one is inclined to be enthusiastic and sanguine that the Laureate's words will prove true:

"O yet one trusts that somehow good
Will be the final goal of ill."

CHAPTER II.

THE ECONOMIC VALUE OF SANITATION.

From time to time this subject in some one or other of its aspects has been discussed in the pages of the Annual Report of this Board; but the necessity for constantly keeping it before ourselves and the public, and the influence which it has in elevating the work of health legislation whether national, provincial or municipal, is a sufficient excuse for again setting forth some of its phases in this Report. Not since the year 1885, when small-pox swept over Montreal and many other municipalities in our sister Province, has any year illustrated this subject so much as the year 1892.

The rumors of cholera in India and Persia had reached us by June, but only in a semi-conscious way did we realize that the epidemic there had any interest for us.

But modern railway progress and the constantly increasing communication both in amount and speed had not been fully appreciated, and the summer had almost passed with its attendant dangers ere we realized the possibility of this Asiatic plague affecting the interests of this continent. And yet within three weeks from its appearance in Hamburg it was at our doors. A single day only in New York, during the fortnight succeeding September 1st, was enough to make the most cynical understand the economic value of sanitation. Business for the moment was paralysed, and even in Ontario everyone talked of and feared cholera.

Almost everyone will admit that the degree of *soundness* or *wellness* of an individual or of a community must have an economic value capable of being accurately measured or weighed in proportion as we know the exact length of the measuring yard or that the balances are sufficiently accurately adjusted; and yet we are constantly forgetting the fact. For the successful study of this problem we, however, need to constantly make use of the two factors of observation of the causes and of registration of the results of disease.

All must agree that the individual life has a certain value to the State simply from its power to produce wealth.

The first estimations regarding the value of life were intended to enable the Government of England to fix the annual amount which ought to be paid as an annuity on a certain amount paid over to it; and that insurance companies might equitably estimate the amount of premium to be paid on a policy issued for a given amount. The result of extended inquiry into the lives of Government annuitants was that, during the century preceding 1830, the length of life had notably increased, and notably in the years succeeding the Napoleonic wars.

Baron Delessert showed that in France in the

14th	century,	1	person	died	in	every 17
17th	"	1	"	"	"	25
15th	"	1	"	"	"	30
1820—25		1	"	"	"	37

The importance of this fact became at once manifest. It was seen that if a life was prolonged by 25 per cent. the Government would then by that much be paying too much for an annuity. On the other hand insurance companies were becoming enormously rich

by charging on the supposition of the duration of life being, say 25 per cent. shorter than it actually was.

We thus can see that a life must be considered as having an actual cash value to the State whether viewed from its power to produce wealth, or by the capital which, made by the annuitant, is actually loaned to the State, for investment in some presumably profitable manner.

Manifestly, therefore, the saving of the lives of the population of a State is one of the most positive methods for the production of wealth—much better by far than the introduction of new populations by immigration, who, apart from their possibly lower physical, moral and mental status and foreign tongue, must be for some years at the best, of small value, not being trained to the special customs and class of work in a new country.

The following are a few illustrations of how wealth in this sense has increased in England :—

In	1650	England had a	population of	5,500,000
"	1801	"	"	8,892,586
"	1878	"	"	25,000,000

And during this latter period she has also contributed many millions to the population of the United States. We have already seen that the duration of life was increasing, the Registrar General's returns showing that—

In	1889—a cholera year, the death rate was	25.1	per 1,000
"	1886—typhus fever " "	23.0	"

From 1876 onward there has been an almost uninterrupted fall. Thus in

1871—80, the mean death rate was	21.27	per 1000
1889—it was only	17.8	"

Says Dr. Farr of the period between 1871-80, the reduced rate meant an annual saving of 20,000 lives; or comparing the period of 1838 to 1854 with that of 1871-80, the rate in the latter added nearly two years to the life of every boy, as compared with that in the former or 39.91 years increased to 41.35, or to put it in another way, taking the annual births between 1871-80 at 858,878, the difference between the two rates shows a gain for the whole children at the latter rate as compared with the former of 1,800,047 years.

What this saving of life means is that every year of the latter period, saved to England 20,000 people or 200,000 in all, having a length of life of 40 years—thereby giving to the State all the wealth, which each may produce during 40 years.

It must, from what has been said, appear evident to every one that whatever has improved the conditions whereby life is prolonged, served the economic purpose of increasing the population of a country. But some might object that it does not follow that wealth has increased simply because population has—remembering that $50.00 of pure silver dollars would equal $100.00 silver dollars if 50 per cent. were base alloy.

I shall endeavor, however, to show further that the quality of the value of life is actually proportionately increased by sanitation.

This is seen in several ways, thus—

(*a*) Assuming as is the case that about one in every fifteen of the English population is an artizan, and that he has two years added to his life, then as skill increases with experience we may say the producing value of 2,000,000 and more of English artizans for two years is added to the wealth of the country.

(*b*) By the relatively higher continued healthfulness of the man, who is to live two years longer than under other conditions. This is a fact beyond dispute. It has not infrequently been stated in a superficial way that by reducing the mortality we maintain alive a population of weaklings. But the statement is most misleading. If it be true that, if by purifying the air of a city or a single workshop, wherein are 100,000 people or 100 employees we are able to keep the infants and children from dying at the rate of one in four in the first year, or 50 per cent. of all under five years in the second, it is equally true that in the other we have enabled, say, 100 work girls to maintain a higher average

of health ; and while the weak might in an impure air have become unfitted for work, the strong would proportionately have had their average of health reduced. Or to put the matter in another way, suppose 10, 9, 8, 7, 6, 5, be taken as degrees of resistance to disease, and that all below five are doomed to die before reaching 21 years, then it is plain that any influence by which the resistance to disease is lessened, does by so much tend to depress the first five and proportionately the rest below the line which to the on-looker is called the health-line. Indeed, as has been well said, "the whole object of sanitary legislation is to so increase the resistive power, as to incase the body in that which shall be proof against an attack" ; this is on the positive side, but on the negative it may be said yet more truly "that the object is to remove those influences or conditions, which may be called the attacking forces."

Sir Spencer Wells, before the Sanitary Institute of Great Britain as president, said:— Assuming that in 50 years 2,000,000 of a population had been saved by sanitation and medical work, "their economical value was at least 300 million pounds, and that a clear gain." Formerly it was calculated that $\frac{1}{20}$ of the population was constantly sick and the products of all that labor necessarily withdrawn ; a great deal of this sickness has been altogether prevented, and the duration of that which comes in spite of sanitation is lessened.

But having set forth the economic value of sanitation so far as it saves lives to the State, I shall now illustrate its bearing upon the prosperity of some of our lakeside cities before adverting to some of the more modern of our sanitary or life-saving appliances.

To this end I have had prepared the following diagrams which show what the death rate was in the several cities during the year 1890, for the two contagious diseases which cause the major proportion of deaths, typhoid and diphtheria. As will be seen from their relative prevalence in different cities the two diseases stand in very distinct categories as regards causation. While both are filth diseases, and hence are both capable of being propagated in town filth and sewage, yet diphtheria does not seem capable of causing extended epidemics through polluted water supplies, while on the other hand typhoid is now known to cause town epidemics principally through this medium. They also have two other distinctive differences, viz.: first, that typhoid attacks especially persons fifteen years and over, while diphtheria is comparatively infrequent amongst adolescents and adults ; and, second, that while typhoid is but slightly disseminated by direct contact with ordinary care, diphtheria is intensely infectious to the young who are peculiarly susceptible to it.

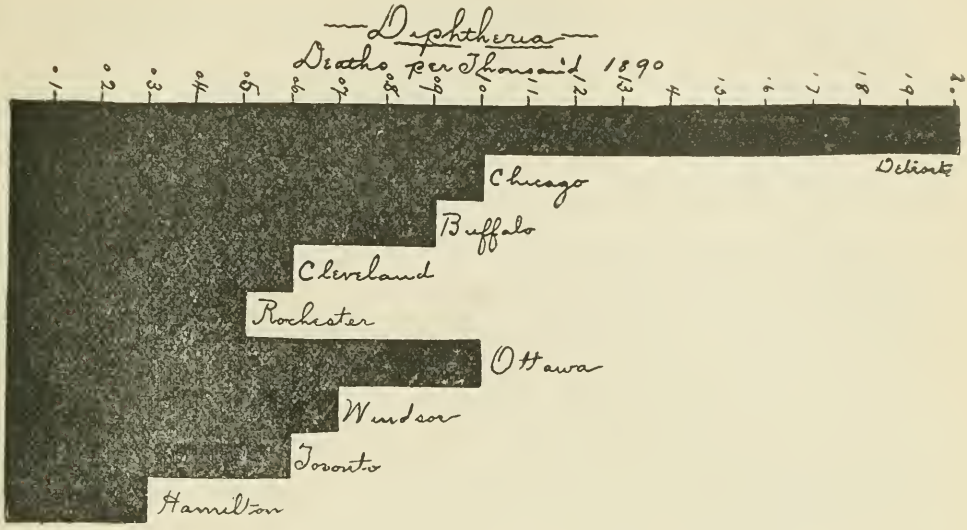
The diagrams illustrate this in a remarkable manner. Take Chicago and Detroit for instance. In Chicago the death-rate from both is high, while in Detroit typhoid is remarkably low, and diphtheria is enormously high ; the disproportion here seen to be so great, exists to some extent in the other cities, while the special condition to which I shall allude exists to a greater or less extent.

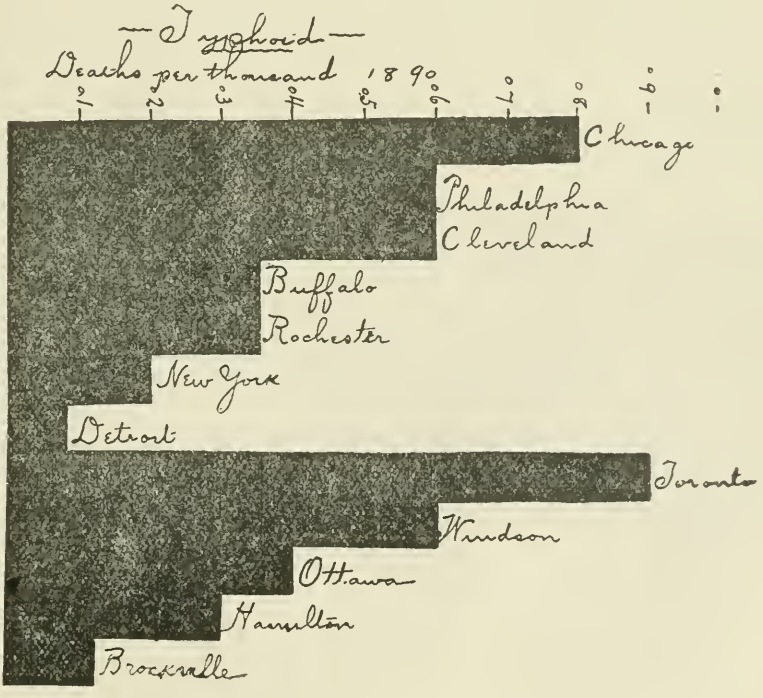
By reference to the diagram for typhoid, it will be seen that typhoid is high in Chicago, Cleveland and Toronto. All of these cities get their water supply from the great lakes as do the others, but mark the difference. In each of these the city's sewage is poured into the bay or lake in front of the city ; whereas Detroit, Buffalo and Brockville pour their sewage into the great rivers flowing past them at the rate of several miles an hour making the least contamination of their drinking water impossible. In the case of Hamilton, while the sewage is poured into the bay, it is wholly land locked, and the water is pumped from the lake outside the bar. Curiously enough, Windsor, a town of 10,000 inhabitants, has a death-rate from typhoid approaching the average, though it is opposite Detroit ; but the difference is that Walkerville sewage flows into the river a few hundred yards above the Windsor intake pipe.

I have made this digression in order to explain what the first diagram apparently teaches, and now I shall return to the economic aspect which the diagram presents. It is seen in a moment in the second diagram.

It will be seen that I have assumed that for each death from typhoid there are 19 who do not die, at any rate from this disease, although as is too often the case, it supplies conditions by which the seeds of consumption obtain an entrance to the system and produce sooner or later their fatal effects.

I have also assumed that each case of typhoid means a loss of a month to the patient,


Diphtheria
Deaths per Thousand 1890
Chicago
Buffalo
Cleveland
Rochester
Ottawa
Windsor
Toronto
Hamilton


Typhoid
Deaths per thousand 1890
Chicago
Philadelphia
Cleveland
Buffalo
Rochester
New York
Detroit
Toronto
Windsor
Ottawa
Hamilton
Brockville

and one month to the nurse ; but have said nothing about the actual expenses of the sickness in physician's bills, medicines and undertaker's fees, all of which would be proper items of loss of capital.

Taking then the figures as we find them, and with these approximately correct assumptions, we obtain the following for Chicago :

Ten cases each, 8 = 16. per 1,000, 60 days for nurse and patient, or 960 days loss of time.

960 days × 1,200 = 1,152,000 days per 1,000.

This divided by 300 working days=3,840 years, or the loss of the year's work of 3,840 men.

At one dollar a day this means the loss of $1,052,000.00 to Chicago for one year of sickness from typhoid alone. This rate would mean for Detroit a loss of $210,400.00, whereas Detroit actually did lose only $24,000.00. On the other hand, if the Detroit, rate were reached by Chicago, $800,000.00 would be saved, a sum which would pay the interest at 3 per cent. on over $26,000,000.00 of capital to invest in new water-works.

Without discussing the losses from typhoid further, I turn to the deaths from that other disease *par excellence* of this northern temperate region—diphtheria.

I have had a chart arranged to show its prevalence as well. It must undoubtedly be considered the pest of our Province. Its microbe can exist outside of the body, like that of typhoid, but has in addition an extreme capacity for spreading by infection. From tables illustrated in the diagrams I therefore draw the following conclusions, that—

(1) In a city or town with an average attention to sanitation, we have a more or less constant presence of so-called sporadic cases, amounting perhaps to 3 to 6 per 1,000. Under, however, peculiar—

(2) Seasonal atmospheric conditions (such as a prolonged dry, warm autumn) the germs of the disease seem to freely develop in organic filth. Hence an extension of the sporadic cases take place, but mark the difference with typhoid.

(3) Each case of these becomes a new centre, each house wherein a case occurs is liable to become a distributing point. Persons, and especially children going to school, spread it broadcast, unless the strictest municipal supervision is exercised over these cases and the public school.

(4) That since the direct infection is enormously more common in the sporadic cases, than in typhoid we have in this fact the evidence that the deaths from the disease are in large degree preventable, and hence form a most important factor in this question of the economics of sanitation.

Observe what the losses mean. It may be taken as a fair average that one death occurs in every five cases of diphtheria, and at least one nurse's services are constantly required for say an average of a fortnight. From these data it thus becomes easy to calculate as in the case of typhoid, what the loss means. The rate of deaths is : typhoid, 5 ; diphtheria, 8. But we have assumed in the case of the first, 20 cases to one death, and with the latter five cases to one death. Hence the ratio of cases is : typhoid, 20 ; diphtheria, 8 ; and if we assume that the loss in the latter is only $\frac{1}{3}$ of the former in time, we can add, what is probably below the real figure, about $\frac{1}{12}$ of the loss from diphtheria to be added to the total average loss for all the cities in the list.

Further comment seems needless. It surely is not necessary to add to all this the economic loss from doctors' bills, drug expenses and undertaker's charges, in order to show the extent to which cities lose annually from imperfect sanitary methods.

As to the measures necessary to lessen such economic losses some of these are indicated in the several succeeding chapters.

CHAPTER III.

SCHOOLS AND THEIR RELATION TO THE SPREAD OF CONTAGIOUS DISEASE.

There are in Ontario according to the Annual Report of the Department of Education for 1891, 5,828 public and separate schools, 8,336 teachers, and 527,909 pupils. Of the pupils in public schools alone 2,615 are under the age of five years, and 488,809 over that age.

The proportion of children at different ages, if we adopt the averages established by fifty years' statistics in England, would be approximately :

From 0 to 5 years of age.....13.5 per cent. of the whole
" 5 to 9 " .....11.8 " "

or almost exactly 25 per cent. of the whole population is within the first ten years of life. While in Ontario the compulsory school age begins at six years, yet a very notable proportion of children attend kindergarten at ages much younger than that. For the study of this subject it will be sufficient that a single disease, diphtheria, be taken and I propose, if possible, to show what relation its prevalence bears to the attendance of children at our public schools.

It is regrettable that the educational returns do not contain the total number of children enrolled according to their ages by years. I have been, however, favoured with statements by several of the prominent public school inspectors of the Province, which though not absolutely correct will serve fairly well as a basis for broad conclusions. From these I gather that there were,

In	Hamilton..of	pupils	between	5	and	10,	registered, (53 per cent.)	3,623
"	Guelph... "	"	"	5	"	10,	"	793
"	Stratford . "	"	"	5	"	10,	"	1,011
"	St. Thomas "	"	"	5	"	10,	"	1,421
"	Windsor . "	"	"	5	"	10,	"	1,450
								8,298

According to the table of populations of these several cities taken from the last census returns of 1891, the total population is 89,705.

It will be seen from this that the total school population between 5 and 10 as given in these returns amounts to 9.2 per cent. of the total population. The table from English returns shows the true percentage between 5 and 10 (10 not inclusive), to be 11.8 of the total population. Applying these rates to the school population of Ontario it appears that there is a deficiency in our school population, or in other words, that the absentees amount to 2.6 per cent., or more than 25 per cent.

From the returns for the Toronto schools, we have given the following average ages of the different grades.

Junior First Grade	6.6 years.
Senior "	8.0 "
Junior Second	9.63 "
Senior "	9.98 "

If the kindergarten classes be added to these I think it may be said that we include the total number of children between 5 and 10, which is calculated by Mr. Ballard, the Inspector for Hamilton, as amounting to about 55 per cent. of the total school population. This number as already stated, including absentees, amounts to 11.8 per cent. of the total population.

We have now to refer to the relative death rates for different periods. The English returns for 1881 give the following:

Proportion of deaths under 5 years ..... 13.55 per cent.
" " from 5 to 10 years ..... 12.11 "

As regards the incidence of any special disease at different age periods, we have from English statistics the following:

Total deaths from scarlatina per million.		Deaths at successive age periods.	
Under 5 years	3,681	241	.....
From 5 to 10 years	1,667	106	Per 1,000 cases in hospital.
	5,348		

Or per 1,000 total deaths in hospitals:

Under 0 to 5 years 458
" 5 to 10 " 203

We now have most of the data which will serve us in this enquiry.

From the tables from the Registrar-General's Report for 1891, I find that the total deaths in seven cities from diphtheria at the two different age periods is:

Under 0 to 5 years .....155 = 44.7 per cent. of total from diphtheria.
From 5 to 10 " .....110 = 31.6 " "

or more than 75 per cent. of the total deaths from diphtheria in these cities occur in the first ten years of life.

The following table shows comparatively the deaths within the two five-year periods of scarlatina in England, and diphtheria in ten Ontario cities, and the total deaths from the two causes in each:

Year.	Scarlatina in England.	Diphtheria.
Under 0 to 5	3,681 or 68.9 %	155 or 58.5 %
From 5 to 10.....	1,667 or 31.1 %	110 or 41.5 %
Total at all periods of life	5,913	347

It will further be noticed from the above that while 90.4 per cent. of the total deaths from scarlatina occur within the first decade, that 76.3 per cent. of all deaths from diphtheria occur within the same period. The peculiarly fatal tendency of scarlatina in little children is thus actually illustrated, and the same is seen in the table giving the deaths for the same two periods of those actually sick in hospitals. Indeed, the peculiarly fatal character of scarlatina attaches to the first three years of life.

Diphtheria on the other hand instead of affecting children in the first year of life, as does scarlatina,—the latter having nearly one-fifth of the total deaths in the first year—causes in the first year less than one fifteenth of the total deaths from this cause. It is thus natural to expect that the percentage of deaths from diphtheria within the first ten years to the total deaths would be less than from scarlatina.

It is nevertheless very manifest that a very large proportion of deaths from diphtheria occur within the 5 to 10 year period, or the period of school life; and that their occurrence and this excess may have a relation to the danger of contagion in school, greater indeed than in the case of scarlatina in England is probable for two reasons:

1st. Because that before or at the moment of invasion of scarlatina the child sickens, the eruption occurs and the child is kept from school till convalescence and close quarantine is complete.

2nd. Because that in England the severity of scarlatina has made isolation of it to be rigidly practised ; whereas in diphtheria mild cases of sore throat may go on unobserved as diphtheria for several days, and in such cases early convalescence has in many instances caused children to return to school before their throats have become free from infection. That in Ontario cities, a portion of this high percentage of deaths from diphtheria is due to school life, may perhaps receive further evidence from the fact that in Massachusetts during a series of years the proportion of deaths in the two five year periods stood as 64 to 24, instead of as in these tables 31 to 22.

Another element which enters most notably into the diffusion of epidemic diseases through schools is, as has been recently shown in an exhaustive paper on Epidemics in Schools by C. E. Shelly, M.D., of Haileybury, Eng., the fact that there is a large unprotected class termed the "explosive ratio," who have never suffered from these diseases. The total number of unprotected he shows to be nearly 60 per cent. even though entering school as late as ten years. He then states that the other condition is that of *close aggregation* of this susceptible material. While this favorable condition for the spread of any contagious disease applies especially to the class of eruptive diseases it does to some extent at least temporarily apply to diphtheria.

From the exhaustive reports of the Medical Officer of the Local Government Board of England, I have selected one or two illustrative statements of the influence which schools have on the spread of diphtheria. Thus in a report on diphtheria in Enfield in 1888, by Dr. Bruce, it is stated that within 4 weeks during which 75 individuals in 13 different families were attacked, 11 dying, 29 cases occurred out of 59 total inmates in 10 houses, and that 9 out of these 10 houses had children attending the same school.

To illustrate the fact that diphtheria has not till very recently been viewed seriously in England, this schoool was not closed, although parents were advised to keep children with sore throats at home. He further states that taking several hundred houses together diphtheria tended to pick out children attending the same school.

In an outbreak in the Aylesbury district during the same year Dr. Spear, who investigated the outbreak, speaks similarly regarding the excessive incidence of the disease in two particular schools. Referring to its tendency to cling to a house—which remark applies with special force to schools—Dr. Spear further notes that the houses which especially suffered from the outbreak in 1885-6, had more outbreaks in the epidemic of 1887-8 by 60 per cent. than did the other houses on infected streets. In ten instances the disease in the second outbreak occurred in houses invaded in the first epidemic.

Summing up the details of this outbreak Dr. Spear says :—

1st. From October, 1885, to March, 1886, excessive mortality from diphtheria occurred in a town previously largely free from the disease.

2nd. Its first appearance was in a row of cottages, having a first imported case.

3rd. There was a subsequent spread of the disease noted amongst the children of certain schools.

4th. From March to the next November, the outbreak almost wholly disappeared.

5th. It then re-appeared in the same first row of cottages.

6th. Along with the outbreak was an unusual prevalence of sore throat of an apparently non-specific kind.

As one of the conclusions drawn by Dr. Abbott, of the State Board of Massachusetts, from an extended study of the vital statistics of the State, relating to diphtheria and croup, from 1871 to 1888 it is stated :

"That the aggregation of people and especially of children, as in public and private schools, in workshops, in factories and in public assemblies facilitates its spread."

It is unnecessary to remark, as is readily gathered from the statistics already given, that the disease prevails to a large degree in children under school age wherever they have been exposed to the infection. It is, of course, plain that in no sense does an ordinary dwelling room differ from a school-room so far as serving either to disseminate or retain the infection if the latter be once introduced.

The purpose of these remarks is to specially direct attention to the school, as the medium by which cases of diphtheria if coming from a house where the disease from whatever cause has been introduced, become the occasion of epidemic explosions of the disease in a community.

Before referring to the special peculiarities of schools in this particular it may be well to refer for a moment to the immediate cause of the disease.

It is now eight years since Loeffler isolated a bacillus from diphtheritic membrane, and since that time bacteriologists in many laboratories have satisfied themselves that in this bacillus we have the specific cause of diphtheria. Up to the the present the contagious character of the disease has been recognized by many physicians, and they with medical officers of health everywhere have treated diphtheria as a contagious disease. The special peculiarities of this microbe have been further studied, and its cultivation for diagnostic purposes have been fully illustrated in the notable experiments of Yersin and Roux of Paris.

The life history and conditions most favorable for the propagation, dissemination, preservation and destruction of this bacillus have likewise been fully set forth. Observers had long noticed the tendency of diphtheria to develop in those houses in which organic decay was notably present, either as accumulated filth in cellars, or having dark, damp and ill ventilated spaces under buildings, where decaying wood was present. It has by experiment been further demonstrated that the germs will live a long time in unclean, dark and ill-ventilated rooms, and on cloths, clothing, etc., when not exposed to fresh air and sunlight. On the other hand it has been shown that in light, clean and well-ventilated rooms the virus of diphtheria within a few weeks becomes largely inert or destroyed. Public water supplies have never been shown to have any intimate relations to the spread of diphtheria; and, indeed, it has been shown that the germs are incapable of long sustaining life in polluted water exposed to air and sunlight. Organic deposits from sewage, however, if exposed along the shores of a bay or stream, do probably, like other accumulations of organic filth, maintain the vitality of the bacillus, and it probably is true that from privies and from night-soil exposed in fields and from street refuse deposited in dumps the germs of diphtheria have when dry been wafted by the air into neighboring houses and so caused outbreaks of the disease. The air likewise, from sewers, whether from man-holes or by defective plumbing, have, especially in the latter case, frequently been the cause of outbreaks of the disease. In all these ways diphtheria outbreaks have been produced; but the very conditions under which these outbreaks occur best illustrate how the living air of rooms, where the microbe has been disseminated either from a patient or from the clothing of persons exposed in the sick-room or other infected apartment, is daily being shown to be of all agencies the one which plays the most important rôle in spreading the disease.

Ever since the statistics of deaths have been registered with care as in England during the last fifty years, the incidence of what are called communicable diseases in the months extending from November to May has been noticed; but it has not been until bacteriology has taught that the microbes of these various diseases can grow and multiply only in warm temperatures, that the explanation of how house atmospheres, during the period of the year when ventilation is least and when children are kept indoors, have become the conditions under which infection has been most frequent. This is due not only to the fact of the increased number of germs present in house atmospheres, but also to the fact that the conditions most favorable for producing a congested mucous membrane, thereby make inoculation possible, prevail especially in cold weather.

Such are the immediate conditions favorable to the propagation and spread of diphtheria, as of other contagious diseases; but stated broadly the special condition is one of

density of population. This in the study of vital statistics has formed the subject of extended enquiry by many writers. In the study of English statistics the late Dr. Farr was able to lay down a formula by which he was able from the known number of persons per acre or per square mile in any district to calculate the general death-rate, which was found to conform very closely to the number of deaths from the mortality returns.

Thus death-rates,

Calculated gave : 18.90, 19.16, 20.87, 25.02, 28.08, 37.50, 38.74.
Registered " 16.75, 19 16, 21.88, 24.90, 28.08, 32.49, 38.62.

These studies were of course made where sewerage and water supply and other sanitary conditions were largely the same.

The ill-effects of increased aggregation of population have further been found to be much greater in the earlier years of life. Thus from the 35th English Annual Report :

Persons to a square mile	16.6	379	4,499	65,823
Death-rate at all ages per 1000	16.94	21.90	28.02	38.67
Death-rate under 5 years	37.80	47.53	82.10	139.52

The figures in the last column refer to the Liverpool district.

In a remarkable paper published in 1888 by Dr. J. B. Russell, Medical Officer of Health for Glasgow, this law has been illustrated and refined in a most remarkable manner by applying it to the relation between the size of the house and the general death-rate.

He compared the twenty-four districts into which Glasgow is divided and obtained the following results :—

Size of House.	Percentage of population.	Deaths per 1,000.
One room	24.7	27.0
Two rooms	44.7	47.0
Three "	16.0	13.0
Four "	6.1	4.3
Five "	7.1	3.3
Institutions	1.4	3.2

The one and two-roomed houses were commonly what are known as "made-down" houses, *i.e.*, parts of large houses divided into many rooms rented separately. He found further the following, relative to deaths from special diseases per 1,000 of population :—

	One and two-roomed houses.	Three and four-roomed houses.	Five rooms and upwards.
Zymotic diseases	4.78	2.46	1.14
Acute diseases of lungs (including consumption)	9.85	6.89	3.28

These remarkable statistics, from the standpoint of causation, are further illustrated by the experiments of Professors Carnelley and Haldane, published in the Transactions of the Royal Philosophical Society.

—	One-roomed houses.				Two-roomed houses.				Houses of four rooms and upwards.			
	No. of cases.	Lowest.	Highest.	Average.	No. of cases.	Lowest.	Highest.	Average.	No. of cases.	Lowest.	Highest.	Average.
Persons per house (per room in last class	29	2	10	6.6	13	4	10	6.8	18	1	3	1.0
Space per person	29	104	528	212.0	13	148	395	249.9	18	391	4206	1833
Temperature (°Fah.)	21	43	61	55.0	9	50	59	53.5	13	42	63	54.5
Carbonic acid	29	6.3	32.1	11.2	12	7.1	13.2	9.9	18	4.5	11.7	7.7
Organic matter	29	7.8	38.1	15.7	11	5.0	30.2	10.1	18	1.1	12.0	4.5
Total micro-organisms	28	6.0	240.0	60.0	13	8.0	128.0	46.0	18	0.5	22.0	9.0
Bacteria	19	6.0	120.0	58.0	11	6.0	118.0	43.0	16	0.5	16.0	8.5
Moulds	19	0.	5.0	1.2	11	0.	10.0	2.2	16	0.	1.0	0.4

—	Schools.							
	Naturally ventilated.				Mechanically ventilated.			
	No. of cases.	Lowest.	Highest.	Average.	Average.	Lowest.	Highest.	No. of cases.
Per cent. of windows open	....	.....	.....	22	3	.....	.....	....
No. present, including staff	39	27	191	92	64	20	170	20
Space per person	39	56	427	168	164	119	228	20
Temperature (°Fah.)	35	44	65	55.6	62	58	69	18
Carbonic acid	39	7.9	37.8	18.6	12.3	7.0	19.6	20
Organic matter	38	5.0	600	16.2	10.1	3.4	19.0	20
Total micro-organisms	35	8	600	152	16.58	0	58	18
Bacteria	28	8	40.3	151	16.0	0	56	18
Moulds	28	0	4	1.1	0.58	0	2	18
Or above outside air:								
Temperature (°Fah.)	25	3	34	16.8	24	22	26	3
Carbonic acid	39	4.4	34.3	15.1	8.9	3.5	16.1	20
Organic matter	38	0	31.4	7.8	1.1	0	513	20

In this table the relative purity of the air in the better class of houses is admirably illustrated. It is of still more interest for the purposes of our subject to compare the carbonic acid and number of bacteria in the air of these rooms with their amounts in the air of public schools. To make the difference still more evident it must be remembered that schools are occupied but six hours, while the houses are constantly occupied. Still greater differences are seen in the two classes of schools, the one being naturally by fireplaces, open windows and ventilators in the ceilings, while the others were ventilated by means of fans over hot pipes. Thus, referring to the tables, it will be seen that while the number of bacteria in a litre of air in one-roomed houses averaged 60, that in naturally ventilated schools averaged 152, or two and one-half times as many, while that in the best ventilated schools was 18, or twice the number in four-roomed houses and upwards.

Further investigations were made into the source of the bacteria, and it was found that the bacteria in the air of a room were not materially increased by the presence of a large number of persons in a crowded room during a single lecture; neither did they come from the outer air introduced, it being relatively free from germs during these winter experiments. It was therefore concluded that the microbes came from the floor and other parts of the rooms. This was shown to be the case, and that their numbers largely depended on the cleanliness of the rooms.

—	—	No. of cases.	Average space per person.	Average carbonic acid.	Average organic matter.	Average micro-organisms.
One-roomed house	Dirty	7	200	9.9	18 1	41
	Dirtier	13	221	10.7	13.5	49
	Very dirty	6	220	11.0	15.1	93
	Clean	1	295	8.0	13.1	18
Two-roomed houses	Very clean	2	273	12.5	10.8	10
	Clean	4	264	9.3	7.7	22
	Dirty	7	233	9.4	11.2	69
Naturally ventilated board schools.	Cleaner	12	167	19.7	18.1	91
	Ave'ge cleanliness.	12	166	14 2	16.2	125
	Dirtier	12	191	22.5	15.2	198
Mechanically ventilated schools	Cleanest	7	194	12 5	12 7	3
	Clean	11	155	12.8	8.3	10
	Less clean	4	152	10.8	9 8	30

The schools were classified according to their length of time since construction with the following results:

—	Number of cases.	Micro-organisms per litre.
Opened before 1866	7	211
" 1875-1880	20	150
" 1884-1885	5	38

These latter facts showed that the influences deciding the number of organisms were not those of temporary cleanliness; but that the influences at work have a gradually cumulative effect. These influences have been fully investigated by Emmerich, of Leipzig, who made a large number of analyses of the materials in the space between the floor of a room and the ceiling of the one below. To use his own words he showed "there exists nowhere in nature, not even in the neighborhood of human dwellings a soil so highly contaminated with nitrogeneous organic substances and their decomposition products as the damping material under the floor of dwelling rooms." He showed further that the carbonic acid resulting from organic decomposition in the air of empty rooms actually increased, although all other sources of carbonic acid were excluded. He further examined these materials in a prison at Amberg, in which had occurred persistently for years, epidemics of croupous pneumonia, which had attacked every seventh person and killed every twentieth prisoner. He not only found this material full of organic matter

as usual, but also discovered Friedlander's pneumococcus in enormous numbers. The effect of this filth in pneumonia was also shown by Carnelley, whose tables show that the mortality from croupous pneumonia increases from 3.5 per 1,000 in the better houses to 6.6 in the three roomed and 12.5 in the one and two-roomed houses.

The laws which both from statistics and experiment are thus shown to govern mortality rates are evidently dependent for their operation upon the fact that a house atmosphere even at its best is different from that of the external air in (1) its normal constituents, (2) its contained microbes, (3) its gases of decomposition whether arising from the waste products of animal life or of dead organic matter, (4) its relative humidity, (5) its unequal distribution of temperature, thereby producing especially draughts.

Of course it is hardly necessary to remark that the sanitary conditions in certain tenement houses, even where population is dense, may be much better, and the mortality in them even be lower than in the small, crowded houses in country places; but on the whole the broad principles already enumerated are found to hold good judged by results.

Keeping these facts fully in view we may now turn to the examination of the spread of zymotic diseases by means of our public schools in Ontario.

From time to time examinations of the public schools of some of our Canadian cities have been made notably at times when diphtheria has been prevalent in them. I am not in possession of the statistics relative to the cubic air space of our Toronto public schools; but statistics published several years ago in the Annual Report of the Board gave the following figures for Hamilton schools, viz.: average cubic air space, 127 inches.

Floor space.					
Minimum legal space.		Actual space from seat space.		Floor space from actual attendance.	
12.32 square feet.	120 cubic feet.	10.7 square feet.	107 cubic feet.	12.7 square feet.	127 cubic feet.

I was recently called in to examine the sanitary condition of the public schools of one of our cities, and found the cubic air space on the average to not exceed 200 cubic feet per pupil, and this in two-storey buildings.

What this means in the matter of density of population is seen in the following figures:

In a square acre there are..... 43,560 square feet.
" mile " ..... 27,878,400 " "

In a room 10 feet high and allowing 200 cubic feet space to a pupil, the floor space for each pupil is 20 square feet.

In the most densely populated Liverpool district already referred to as having a death rate per 1,000 of 38.67, and of children under 5 years of 139.52, the population per square mile was 65,823, or that of these school rooms is 21 times as great. But it is practically double this in buildings of two storeys, for without special ventilation the air of the two floors is common to all the children. Without, however, pursuing this calculation any further, it becomes abundantly plain that in the limited amount of air of a school-room we have present a condition wholly opposed to the process of infinite dilution which is constantly going on in the outer atmosphere, and that any deleterious materials present in the air of school-rooms has an opportunity for producing most certainly their evil effects. We have first of all in naturally ventilated and crowded schools a great increase of carbonic acid amounting even in rooms with an air space of 300 cubic feet to 15 parts in 10,000, with a proportionate increase of organic matter.

Extended most recent experiments by Merkel in Germany, and by Haldane in England, referring to the effects produced by such air cause the conclusion that they are on the one hand due directly to the poisonous effects of an excess of carbonic acid, and on the other to the absence of the normal amount of nascent oxygen necessary for oxidization of the blood.

That these poisonous effects by directly depressing the system leave it an easier prey to specific bacterial poisons may naturally be inferred; but we now are in possession of experiments on animals which give direct proof of the fact.

Roger has shown that the rabbit which is naturally immune to symptomatic anthrax quickly succumbs to the disease, if at the same time there is injected a sterilized culture of bacillus *prodigiosus.*

Chantmesse and Widal have found that a laboratory culture of the typhoid bacillus which had lost all its virulence and was entirely without effect upon guinea-pigs, proved to be extremely fatal when the vital tone of the animal was lowered by a previous injection of a culture of *proteus vulgaris.* The virulence thus acquired became exceedingly intensified by further passage through animals.

It has been shown also that physical conditions affect the power of resistance in animals. White rats which are naturally immune to anthrax, easily contracted the disease when previously exhausted by being compelled to turn a revolving wheel. Sheep which have been bled contract anthrax more quickly than healthy animals. Fowls which are naturally immune to anthrax, contract it when they have been artificially chilled.

Anæsthetics have been found to act in a similar way. Platania produced anthrax in naturally immune animals (dogs, frogs and pigeons), by inoculating them when under the influence of curare, chloral or alcohol.

In the altered relative humidity of the air of rooms in winter, we have, however, what I believe to be a potent factor in the inoculation of children with the germs of diphtheria and other diseases of the respiratory mucous membrane. Everyone is familiar with the disagreeable sensations experienced in rooms heated by hot-air furnaces where no means is provided for the supply of moisture. I am not aware of any extended experiments on the subject, but the following is sufficient for purposes of illustration:

In a paper on ventilation of schools by Dr. J. J. Cassidy, presented several years ago to the Ontario Health Officers' Association, I find the following condition given of one of the best constructed, ventilated and heated schools in Toronto:

"January 26th, 1887, 3.45 p.m. Examination of the ventilation of Brock Avenue school. Upper room (girls): cubic measurement, 10,786 feet; persons usually present, 59 cubic space per head, 183 feet; temperature, 67°; hygrometer, D. B. 67°, W. B. 53½°, R. H. 41½ anemometer; size of inlet, 4 square feet; air entering per minute, 276 linear feet; air entering per hour, 16,560 linear feet; cubic feet of air entering per hour, 66,240; number of changes per hour, 6.1; door closed and four windows closed; test of air by the senses, not close."

The mere amount of relative dryness in a school-room occupied by children is, however, no index of the evil influence of the air on the mucous membrane; since the exhaled moisture produced in a room filled with little children notably increases that of the room—but only by a process of drying out of the mucous membrane similar to that by which the evaporating pan is emptied of its water. The dry air constantly inhaled passes over the mucous membrane and abstracts an amount of vapor equivalent to about $\frac{1}{30}$ of its volume, the air always being saturated when exhaled from the lungs. If 500 cubic feet of air be taken as the average amount expired by a person in 24 hours, it is apparent that 10 cubic feet of an atmosphere consisting wholly of aqueous vapor is exhaled. It can readily be understood, therefore, how in a school-room with 50 pupils, having an average air space per capita of 200 cubic feet, an enormous evaporation is constantly going on from mucous surfaces, when with this addition the air of the room, as in the examination given, has less than 50 per cent. of saturation. It is manifest that if the normal air of the room has an average humidity of 75 per cent. or is three-fourths of saturation, it will extract very much less moisture than if at only 25 per cent. of saturation.

We have, however, to look to the contamination of the air with the specific virus of disease, if we desire to explain the real and immediate cause of the spread of diphtheria and similar diseases by means of schools. I have already referred to the relative purity of external air as compared with that of house atmospheres. This may be illustrated by a comparison of the results obtained by Percy Frankland, F.C.S., in a suburb of London. Taking several day's average he found 9,800 micro-organisms per cubic metre of air which

were mostly moulds. From the experiments on the air of houses and schools already given I take the figure of the number of micro-organisms in the air of a school of average cleanliness naturally ventilated, and find it to be 125,000 per cubic metre, and in the cleanest of mechanically ventilated schools taken from 22 in all thus ventilated, there were 3,000 microbes per cubic metre.

Were there no such enormous number of microbes in school air as compared with outside air, the relative dangers would be proportionately great in the case of the school, from the fact that the same air is breathed again and again, if not by the same person, then by others, the ratio of change even with good ventilation as compared with the slightest breeze being as 1 to 2,500.

But I need not multiply by illustrations the dangers to which I have referred. Only one word need be said with regard to the conclusions to be drawn from them, which may be summed up as follows:

1. Diphtheria in houses is an intensely infectious disease.

2. It is a disease capable of a very mild character in some cases, while still retaining for several weeks in such patients the ability to transmit the infection and produce cases of extreme malignity.

3. It is a disease specially influenced as regards its infectiousness, by the character and thoroughness of local treatment, and by the frequency with which the air of a sick room is changed. How this latter is true is shown by the effects on the number of microbes in mechanically ventilated schools.

4. It is a disease peculiarly liable to attack with malignity children under ten years of age, but causes relatively fewer deaths than scarlatina amongst children under three years.

5. It is a disease, the germs of which have, when hidden away in damp, dark spaces, where dead organic matter is present, a capacity for prolonged resistance to destructive influences.

6. It is a disease whose germs are weakened in their virulence by free exposure to sunlight, moisture and free air, and these may be completely destroyed within a few days.

7. It is a disease which does not produce epidemics through the medium of public water supplies.

8. It is a disease which may be introduced into houses from defective sewers and bad plumbing; but epidemics in a series of houses on a street, or in a town or city, are never produced except by direct communication and direct infection, and this method of propagation has fresh scope and produces its most potent influences through the medium of public schools, and by persons and children visiting infected houses and by persons from infected houses visiting in healthy homes.

9. It is a disease which during the period of the last census caused 12,500 recorded deaths in Ontario, and probably more than 50,000 cases of the disease.

10. It is a disease peculiarly frequent and fatal in the latitudes lying between the Ohio River and the northern limits of settlement in Canada.

11. It has no special habitat except that it is peculiarly a house disease, and finds its greatest opportunities for spreading in damp and cold climates, where the temperature makes people close their houses to natural ventilation, and where artificial heating is specially resorted to.

CHAPTER IV.

INVESTIGATION OF DISEASE IN ANIMALS*

Tuberculosis.—The question of tuberculosis in cattle has occupied the attention of the Board considerably during the past year, and with increasing opportunities for observation it has lost none of its importance.

No one for a moment considers that it is anything but a subsidiary cause of tuberculosis in the human race, as the great danger lies in the distribution of dried sputum of persons : but still there is undoubtedly a percentage of cases due to infection through the alimentary tract, especially in young children.

No doubt whatever exists as to the danger from the use of milk from tuberculous animals, and for the purpose of investigating milk which is suspected, the laboratory of the Board has been provided with a centrifugal apparatus giving about 1,000 revolutions a minute, by means of which the bacilli which may be present in a sample of milk are made to settle to the bottom and can be drawn off with the sediment This method increases materially the chances of discovering the bacilli in samples in which they are not numerous. By using this apparatus two cases of tuberculosis have been diagnosed.

Another phase of the subject is the danger from using the meat of diseased animals. There seems no doubt that the muscular tissue is only rarely affected with tuberculosis, and in all the experiments performed along this line it is seen that in the majority of cases the expressed juice from the muscles of diseased animals or the blood of these animals has been free from bacilli, but the fact remains that tuberculosis has occasionally been communicated to animals in this way. It is known also that the bacilli of tuberculosis may circulate in the blood for several days without losing their virulence so that in cases of extensive lesions in the animal there is undoubtedly danger from the use of such meat. In this connection it is interesting to note some recent results published in October, 1892, by Schuljansky. His conclusions are :

1. That the flesh of oxen subject to general tuberculosis when freed from all visible tubercular foci, produces loss of health in young carnivora and even death in young cats.

2. That the flesh of oxen suffering from localized tuberculosis is equally dangerous.

3. That two hours cooking of the tubercular meat does not remove its noxious properties. Young cats fed with the same and with the broth, suffered from marked follicular enteritis and parenchymatous changes of the viscera.

4. That the morbid symptoms cannot alone be attributed to the action of the bacilli, but rather to the substance produced as the result of their metabolism.

This last conclusion is in keeping with the results of Prudden's experiments upon the injection of the dead bacilli into rabbits.

Aside from the question of the actual presence of the tubercles in the muscles, there is naturally a great danger of including with the diseased meat a few tubercular glands which might possibly give rise to the disease. Another danger in the use of meat from a tuberculous animal was brought to the notice of the Board a short time ago when a small piece of cooked liver was sent to the laboratory containing a couple of small tubercles. It is possible, in fact probable, that the method of cooking liver (by frying) will raise it to a sufficient temperature to effectually destroy all living germs, but if not properly cooked there would certainly be a danger. It seems strange that a liver containing tubercles could possibly be exposed for sale, as the butcher must have known that it was diseased, and it certainly emphasizes the need of the construction of public abattoirs and the carrying out of thorough meat inspection.

Fortunately there is no necessity now of waiting for the animal to be killed before coming to a decision as to the presence or absence of tuberculosis. We have in Koch's tuberculin a diagnostic reagent which is without an equal as it enables us to diagnose with certainty cases of incipient tuberculosis as when even only one gland is affected.

* This chapter has been prepared by J. J. McKenzie, Laboratory Assistant to the Board. P. H. B.

The recognition of this agent has been delayed for several years until it could be completely tested, but there seems no doubt now that it is to be depended upon, especially in cases which are not far advanced and cannot be diagnosed by ordinary clinical methods.

There was published in a bulletin of the Board last fall a synopsis of all the cases where tuberculin had been used and the results therefrom, but up to that time the Board had not had an opportunity to test it. Since then, however, several opportunities have arisen, the results of which are given below. The tuberculin was kindly furnished by Professor Ramsay Wright, and it speaks well for its keeping qualities when it is known that the sample used was about three years old.

The first cow tested was an ordinary grade Durham which was suspected to have tuberculosis. The animal was wasting, had a slight cough, and the right lung was affected. There was also an enlarged gland in the suprapharyngeal region. Microscopic examination of the milk revealed no bacilli. The temperature of the animal was running between 101° F and 102° F. 0.4 grammes of tuberculin was injected at 5.30 p.m. and the following was the temperature, reading :

4 hrs. after injection.	5 hrs.	6 hrs.	7 hrs.	8 hrs.	9 hrs.	10 hrs.	13 hrs.
103.6	103	103.2	103.8	103.8	103.6	103.4	103.6

This result was hardly satisfactory as the rise in temperature set in too early and was not sufficiently marked, but on account of the incompleteness of the temperature readings we cannot conclude that the fever had reached it height. It is marked, however, by a peculiarity which has frequently been noted, viz., the temperature rises at first to a certain point then falls slightly to again rise, usually to a still higher point.

Taking the clinical symptoms in conjunction with the results of the test as pointing strongly to tuberculosis, the animal was seized and destroyed.

The following are the results of the autopsy :

Tubercular glands in the pharyngeal region, one very large and discharging far back in the pharyngeal wall. Tubercular glands in the region of both bronchi. Left lung with scattered tubercles, right lung very badly diseased, a few scattered tubercles on the pleural lining of the right lung ; diaphragm healthy ; numerous tubercles in the liver ; tubercular glands in the mesentery, including two large tubercular cysts ; kidneys, udder, uterus and ovaries apparently healthy. A microscopic examination of the tubercles from the various regions confirmed the results of the microscopic examination.

The next tests which were made were upon eight highly bred Jerseys.

In six of these 0.3 grms. of tuberculin were injected and in two 0.4 grms. The injection was given at 8.30 a.m., Nov. 5, with the following results :

Before injection.		After injection.								
Nov. 2.	Nov. 4.	8.30	12 n.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	8 p.m.	9 p.m.	10 p.m.
1.....101	101 3-5	101 3-5	101 1-5	101 4-5	102 1-5	102 3-5	102 4-5	102 2-5	102 1-5	.. ..
2.....101 2-5	101 1-5	101 2-5	101 3-5	101 2-5	101 2-5	101 4-5	101 2-5	101 3-5	102	.....
3..... 101 4-5	101	101 3-5	101 3-5	101 2-5	101 2-5	101 3-5	101 3-5	101 2-5	101 2-5	.....
4	101 2-5	101 2-5	101	101 1-5	101 2-5	102 1-5	101 3-5	102 3-5	103 3 5	104 3-5
5..... 101 3-5	101	101 4-5	102	102	102	102 2-5	102 1-5	103 3-5	105 1-5	105 4-5
6.....101 3-5	101 3-5	101 3-5	101 1-5	102 1-5	102 4-5	103 2-5	103 2-5	104 1-5	105 1-5	104 4-5
7.....	101 4-5	101	101 2-5	101 3-5	101 4-5	103	104 2-5	105	105 4-5	105 3-5
8.....	101 1-5	100 1-5	101	102 2-5	103 4-5	104 3-5	104 2-5	104 3-5	104 2-5	104

Thus five of the animals gave a distinct reaction varying in intensity from 3.2° F. to 4.8° F. The reaction reached its height in No. 4 in fifteen hours, in No. 5 in fifteen

hours, in No. 6 between the thirteenth and fourteenth hours, No. 7 the same, No. 8 at the ninth hour, falling and rising again at the twelfth hour. Of these five cows, practically all would have been declared by a veterinarian as free from tuberculosis. Unfortunately it was not possible to obtain a *post mortem* on any of the animals at that time, but the use of the milk and the butter was forbidden.

In the course of a couple of months, however, No. 4 developed a slight cough, due apparently to an enlarged gland in the pharyngeal region, and taking this along with the tuberculin test, the animal was killed, and at the *post mortem* it was found on careful examination that the only lesion present was the enlarged suprapharyngeal gland. This was caseating and proved to be tuberculous. The extreme delicacy of the test may be seen when it is remembered that this gland must have been quite small when the test was applied, yet its presence was sufficient to cause a rise in temperature to 104⅘ degrees in fifteen hours, when only 0.3 grms. of tuberculin was injected.

The attention of the Dominion Government was called to the fact of the results of the test in this herd and the presence of tuberculosis in these animals, and it was suggested that they be destroyed and compensation granted. They, however, refused to take action, and as under the Ontario statutes no provision was made, the Government was not able to grant compensation, the owner was simply prevented from selling or using the milk or selling the animals.

The Board is much indebted to Mr. H. Cooper, V.S., through whose interest in the subject it was rendered possible to undertake the test, and to him and his assistants for help in injecting and taking the temperature.

In addition to these nine cases in which tuberculin was injected we have two others to report for which we are indebted to Mr. J. Hugo Reed, V. S., of Guelph, who injected the tuberculin sent from the laboratory of the Board and took the temperatures.

These two cases were Guernseys, one of which (No. 1) was considered to have tuberculosis from the various clinical symptoms, the other (No. 2) had had a slight cough for two weeks, but was otherwise healthy.

About 0.4 grms. tuberculin was injected into each, and the following were the results :

No. 1 temperature before injection averaged about 100 3-5, injected at 6.45 a.m.		No. 2 temperature before injection averaged about 100, injected at 7.00 a.m.	
7.45 a.m	100 4-5	7.55 a.m	100 2-5
9.00 "	101	9.05 "	100 3-5
10.00 "	101 1-5	10.05 "	101
11.00 "	100 4-5	11.05 "	100 4-5
12.00 "	101	12.05 "	101 3-5
1.00 p.m	101 2-5	1.05 p.m	102
2.00 "	101 3-5	2.05 "	102 2-5
3.00 "	102	3.05 "	103
4.00 "	102 1-5	4.05 "	104
5.00 "	103 1-5	5.05 "	105 2-5
6.00 "	103 1-5	6.05 "	105 4-5
7.00 "	103 1-5	8.05 "	106 1-5
8.00 "	103 3-5	9.05 "	107
9.00 "	104 4-5	10.00 "	105 2-5
10.00 "	102 4-5		

It will be seen that No. 2, the one which gave the slightest clinical symytoms gave the most intense reaction. This is a result which has been noticed repeatedly, and it is just on account of this peculiarity that the reagent is of value as it enables us to diagnose the disease in its incipient stages.

The results of the *post mortem* in these two cases were as follows:

In cow No. 1, mesentery and peritoneum covered with small tubercles, liver with scattered tubercles, udder badly diseased, uterus and ovaries healthy, both lungs badly diseased, pleura costalis and pulmonalis with scattered tubercles.

In cow No. 2, abdominal organs all healthy, both lungs diseased, the right one badly.

In addition to this the calf of No. 1, about a month old was killed, and the following were the results: A very unhealthy looking animal, coat staring and skin harsh, great ascites. All the abdominal organs were found to be diseased except the kidneys. The intestinal canal, mesentery and liver was one mass of tubercles. There was also slight tuberculosis of the lungs, but they were not badly diseased. The lesions in the calf would lead one to look upon it more as a case of acquired tuberculosis than congenital.*

It will be seen from these results that we have in tuberculin a re-agent of extreme delicacy, which if properly and systematically applied throughout the Province, would enable us to gradually reduce the danger from this disease amongst our cattle, provided that subsequent action on the diagnosis is taken.

In the hands of the Medical Health Officer in connection with milk inspection, it would be invaluable as it is comparatively easy to apply, and twenty cows may be tested with the same ease, and at the same time as one may be. It is certainly of a great deal more importance than a test of the quality of the milk, and could be carried on in conjunction with it. Already in some places in Europe the sanitary authorities require that the cows of public dairies should be submitted to the test twice a year.

Several other cases of tuberculosis or suspected tuberculosis have been reported to the Board during the past year, but as yet it has not been possible to take any decided action, with a view to learning the extent to which the disease exists in Canadian cattle.

Actinomycosis.—Several cases of this disease have been reported to the Board during the past year, and the usual action taken under clause 99 of the Health Act.

Fortunately in this disease a new method of treatment has been suggested, which promises to give extremely favorable results. This is by the internal administration of potassium iodide. Its use was first suggested by Bang in Denmark, and it has since been used by various veterinarians in Europe and the United States. The latest results which have come to hand are those contained in a bulletin of the Bureau of Animal Industries of Washington. Under the direction of Dr. Salmon extended experiments were carried out upon animals in various stages of the disease, with in all cases marked improvement, and in the majority complete cure.

With such a radical method of treatment, it seems as if henceforth in cases of early actinomycosis, we may be satisfied with careful isolation and thorough medication to effect a cure.

Glanders.—Several cases of glanders in horses have come to the notice of the Board, all of the animals affected being destroyed. Most of the cases were in the neighborhood of Toronto, and the local authorities have been extremely vigilant in order to prevent such a serious disease from getting a foothold in the city.

As in the case of tuberculosis we have been heretofore dependent upon clinical symptoms and bacteriological examination for a certain diagnosis. We have now, however, a diagnostic reagent which has proved itself of great value.

This is one of the metabolic products of the growth of the glanders bacillus (B. mallei). It is prepared by making a glycerine extract of a glanders culture, filtering it and condensing to a certain strength. When this substance, called mallein, is injected hypodermically into an animal suffering from the disease, there is produced a distinct reaction similar to the reaction produced when tuberculin is injected into a tubercular animal. This reaction is evidenced by the rise in temperature which usually takes place within twenty hours after the injection.

Mallein has been carefully tested in various localities, and results reach us from Belgium, France, England and the United States, all of which speak for its value as a means of diagnosis.

* Regarding the experiments made by Prof. Robertson on the herd of the Dominion Experimental Farm, he states: In every examination made the *post-mortem* examination confirmed the reliability of the tuberculin as a detective of the disease. The temperature in the animals which were destroyed had risen to 106.2° F., 106.2°, 106.0°, 106.0°, 105.8, 105.8, 104.8, 104.0.

We have had one opportunity of testing it in Ontario, and our results are as follows :

The mallein was sent to Mr. H. C. Cooper, V.S., from Professor Roux, of the Pasteur Institute, and it was used upon an animal which he suspected of having chronic glanders.

The following are the notes of the case diagnosed by the veterinary surgeon as a case of chronic glanders.

Nov. 12, at 11 p.m., injected 2cc. of dilute mallein :

Time.	Temperature.	Pulse.	Respiration.
November 12, 11 p.m.	100	38	Normal.
" 13, 5 a.m.	100.6	38	"
" " 7 a.m.	102.6	46	"
" " 8 a.m	103.8	48	"
" " 9 a.m	104.8	50	13
" " 10 a.m	105.8	52	14
" " 11 a.m	105.4	52	14
" " 1 p.m	105.4	52	14
" " 4 p.m	106.4	56	28
" " 9 p.m	106	56	48
November 14, 6 a.m	104.4	42	30

On post-mortem being made glanders of lungs and bronchial glands was found

The animal was condemned on this evidence, and at the *post mortem* examination the diagnosis was confirmed.

The Pasteur Institute, Paris, manufactures both tuberculin and mallein, which is sold in the concentrated form at one franc (20 cents) per cubic centimetre, one-third to one-half of a cubic centimetre being sufficient for an animal.

Hog Cholera.—Only two notifications of outbreaks of this disease have been received by the Board during the year, and in only one was an opportunity given for an examination of the tissues, in this case the results were positive. In this case the Dominion Government inspector had simply diagnosed "parasites" and refused to grant compensation. Specimens of one of the animals were sent to the Board and proved to be a typical case of hog cholera, the lesions being all characteristic and the bacillus being isolated.

Foul Brood in Bees.—Investigations have been carried on in the laboratory upon the bee disease known as foul brood, which is very common in Ontario.

Cheshire and Cheyne first showed that this disease as it is found in England was due to a specific germ, bacillus alvei. Bacteriological examinations of the Canadian disease showed that the same germ was present.

It is customary for bee-keepers to say that if brood is allowed to die and rot, that foul brood will arise, but in no case of such rotted brood was it possible to obtain bacillus alvei although it was always found in cases of the true disease.

The action of hot wax was investigated in order to discover if possible the danger arising from the use of infected wax in the manufacture of comb foundation.

Apparently where the heating was carried on a sufficiently long time, there was little danger from this source.

The action of medicated syrup on the germ was tried, as a method of treatment by such syrups is advocated by many bee-keepers.

In none of these (carbolic acid, salicylic acid, beta napthol), was there a sufficient strength of the germicide to destroy the germs, although they prevented germination of the spores.

CHAPTER V.

HOW CONSUMPTION IS SPREAD, AND SOME MEASURES FOR ITS PREVENTION.

In view of the fact that consumption is of all causes that which produces the greatest number of deaths in temperate climates, wherever settlement has become permanent and population has become in any degree dense, it is proper that the Provincial Board of Health should again draw special attention to the paramount importance of the medical profession, officers of health and the general public realizing the nature of the conditions under which in everyday life the disease attacks the individual and gains an entrance into families and the community, and of how the people generally may do much to lessen the danger to which they are exposed.

In the account given of the discovery of the cause of consumption, now spoken of as the bacillus of tuberculosis, by Professor Koch, he states that he found them in tubercles or nodules from the lungs and brain of many persons, in inflamed scrofulous glands, in joint inflammations and the chalky nodules from the lungs of animals, as the ape, the hog, the guinea-pig, rabbit, etc. During the last ten years much further knowledge has been gained regarding the means by which the disease is disseminated, the most important being the fact of its spread by means of the milk and flesh of animals.

It will not be wondered at, therefore, that a disease, with a history so ancient as consumption is known to have, should during so many centuries have found its way into every portion of the habitable globe, wherever the conditions were such as to make its existence possible. That it has spread amongst all civilized races through favoring conditions will be shown later on; that there are few families in all Europe whose ancestors have not at some time or other suffered from it, will probably be admitted; though that there are many existing families who have no history of ancestral taint for several generations abundant evidence would seem to prove. This being admitted, and the affinities of the disease with glanders and leprosy being assumed, the comforting conclusion is forced upon us that as compulsory destruction of glandered horses has eradicated this disease from many communities, and as segregation or isolation of lepers has practically cast this opprobrious disease out from amongst Anglo-Saxon races, so consumption in some perhaps far off and ideal condition of human society, may similarly become a matter of only historical interest to the physician and statistician.

As the causes and contagiousness of consumption have become known, so its hereditary nature is being less insisted upon, and the possibility of the disease being induced is becoming proportionately prominent.

To illustrate, however, the task society has before it, the following figures are given:

During the twenty-five years ending 1886, the average total deaths from phthisis have been 50,000 yearly in England, and those from other tubercular affections 17,700, in all nearly 68,000. That however great this may be, it means a notable reduction, is gathered from the following tables:

TABLE No. 1.

Mortality per million persons of all ages.

——	1857-60.	1861-70.	1871-80.	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Phthisis	2679	2475	2116	1885	1844	1870	1812	1752	1718	1591
Other tubercular diseases.....	804	781	762	705	729	707	738	654	727	65

TABLE No. 2.

Ontario, 1881, phthisis in persons over 1 year.

——	No.	Per cent. of deaths of persons over 1 year.	Ratio of 1,000 of population.
In Ontario cities	464	14.6	2.04
In towns	213	17.0	2.01
Rest of Province	1720	13.0	1.08

Ratio of consumption to all causes.

In cities ..... 14.67 per cent.
In towns ..... 17.00 "
In country ..... 13.00 "

TABLE No. 3.

General death-rate from phthisis in England in 100,000 population.

——	A. Agricultural pursuits.		B. Industrial pursuits.	
	Men.	Women.	Men.	Women.
1857-1867	209	253	243	275
1868-1877	190	205	230	224
1878-1888	153	165	191	179

In the above English tables are found many interesting facts. Of these one is notable, viz., the fact, as seen in Table 3, that in agricultural communities the proportion of deaths from phthisis thirty years ago was almost equal to those engaged in industrial pursuits. While this serves to especially illustrate the insanitary conditions of the farm labouring class in those years, it points similarly to the fact that even with the many modern improvements in the sanitary condition of workshops, the over-crowding which is induced by increased manufacturing industries has failed to equal the improvements which have marked the habits of life of the English working classes. The great difference between this class in England and in Ontario is gathered from the foregoing figures.

During recent years most extended studies of statistics of tuberculosis have been made, from amongst which the notable fact has been educed by Bayard, who found that the ratio of frequency in the occurrence of the disease in men and animals in different districts has run almost parallel.

The statistics already quoted in Table 3, showing the number of deaths amongst the women of the agricultural class in England, as compared with the men, and showing the malign influences of indoor life, the ratio being 230 women and 205 men and of the greater mortality in industrial operations, the ratio being 467 to 664, fully illustrate the point that with the decreased resistance of the system, due to industrial pursuits, is associated the increased danger due to greater exposure in an atmosphere impure and containing the bacilli of tuberculosis.

"Mager, from Bavarian statistics, estimates the proportion of deaths from phthisis between town and country at 100 to 61." (Hirsch).

This increase of the phthisical amongst the industrial classes is due not alone to the increased dangers of infection, but to the nature of the occupation. "Dusty trades," says Wynter Blythe, "are specially liable to produce tubercular disease."

Dr. C. Lombard states that of 1,000 deaths of adults from consumption they could be classed as follows :

Occupations with mineral emanations	176
" " various dusts	145
Sedentary life	140
Workshop	138
Hot and dry air	127
Stooping posture	122
Sudden movement of arms	116
Muscular exercise by active life	89
Exercise of voice	75
Working in open air	73
Animal emanations	60
Occupations in which watery vapour is breathed	53

The tendency to consumption, in the town districts Dr Farr remarks, was increased to 24 per cent., and to typhus 55 per cent. ; but as the absolute mortality from consumption is three times as great as from typhus in towns, and nearly four times as great in the country, the excess of deaths from consumption caused by the insalubrity of towns is greater than the excess of deaths by typhus, a fact which has been hitherto overlooked. The deaths from phthisis were 437 in the towns and 351 in the country districts to 100,000 living.

That this increased mortality has its relations to the directly increased dangers of of infection may be seen from the investigations on the relative number of germs and amount of organic impurities in houses with different numbers of rooms, by Prof. Carnelley, of Dundee, as set forth in the III chapter of this Report. Everywhere, but especially in the dwellings of the poor, are seen crowding and uncleanliness, and food, poor both in amount and quality, and in its preparation.

The following from the Local Government Board's Report for 1889 shows the necessity for attention to this source of disease :

" Milk continues to be the chief subject of analysis, out of 26,344 samples of various articles of food, drink and drugs, no less than 10,859 were of what professed to be milk, of which 11.9 per cent. were condemned ; while in one of the London districts, St. Pancras, out of 129 samples no less than 55, or nearly 45 per cent., were condemned."

The following instance illustrates the enormity of the crime of adulteration and the inadequacy of the fine to prevent adulterating :

" In another case in which the milk vendor stated that he rarely sold more than a farthing's worth at a time, the sample taken was found diluted with 15 per cent. of water, but the magistrate considered that one shilling was an adequate fine. On this decision the public analyst comments as follows :—" It is these small portions of milk which are used to fill the bottles of young children, and are often diluted by the parents after the purchase, and thus it is impossible to say how weak the milk becomes before the same is used, but it is not very difficult to understand why the mortality amongst the children of the poor is so great."

As might be inferred the dangers minimized by the small amount of milk used by the poorer classes, is on the other hand increased from their milk supply, of the poorest quality, being more likely to come from dairies, inferior both as regards the healthfulness of the cows, and the cleanliness of their surroundings. The high mortality amongst the children of the poor may fairly be charged, in large part, to the marasmus arising from mal-nutrition due to insufficient and unwholesome food.

Under these conditions it is plain that whatever inherited weakness there may be, the subsequent conditions result in a lessening of the natural resistance of the system to disease. Councilman well illustrates the difference in the resisting power of different individuals by the amount of connective tissue formation thrown around infected points, as a cavity or miliary tubercle. He says : " In some cases (in autopsies) almost nothing of this is seen, and the disease passes rapidly into inflammation and caseation. These differences show themselves in different organs of the body and indurated and healed apices of lymph and bronchial glands are common." Referring to the assumed predis-

position in combatting hereditary tuberculosis, he further says: "All conditions of life which produce a low state of vitality in the system predispose to consumption."

Turning then to some of these, in addition to what has been said regarding improper and and deficient food, we would place first overcrowding.

Overcrowding.—The following statistics *re* increase of general mortality according to the population per acre is of interest:

James T. Hummach, F.S.S., Assistant-Superintendent of Statistics, Registrar-General's Office, says, speaking of the "Relation between Density of Population and Mortality from Consumption": "The facts about to be adduced will show that density of population, so far from being an unimportant element with regard to the mortality from consumption, is, in fact, a very potent agent in producing that fearful and destructive malady."

"Overcrowding is of two kinds: (1) on the superficial area, (2) in cubic space; and either may exist independently of the other. In the country where there is no overcrowding, a labourer's cottage may be so overcrowded by its inmates that disease may break out; while in the case of model lodging-houses and many well-constructed public institutions, it is quite possible, by a suitable construction of buildings, to have a dense population living healthily because occupying a large cubical space."

Table No. 4.

Groups of 10 districts each.	Density.	Annual rate of mortality per 100,000 living.	
	Square yards to each person.	From phthisis.	Other diseases of the respiratory organs.
No. 1	180	375	659
" 2	119	405	771
" 3	35	485	914

"Thus in the districts with the least density the deaths from consumption were 375, and in those of most density 485, to 100,000 living; while other lung diseases caused 914 deaths in the densest, against 659 in the least dense districts, out of the same numbers living—the deaths out of the living, not the proportion they bear to the mortality from all causes, being the true index to the fatality of particular diseases."

In the Registrar-General's report the mortality from different diseases in London and twenty-four other city districts, with an aggregate population of 3,769,000, was contrasted with the mortality from the same diseases in counties containing a population of 3,559,000, chiefly engaged in agriculture.

The urgent necessity for increased attention to the dangers in childhood is illustrated by statistics. Thus the Registrar-General of England has shown that while the death-rate per million, from phthisis, and tubercular brain disease, since 1861-70 has decreased, that from tabes mesenterica and scrofula has increased, thus

	Phthisis.	Hydrocephalus and Tubercular Meningitis.	Tabes Mesenterica.
1861-70	963	2213	2267
1871-80	767	1800	2558

With the malnutrition which plays so fatal a part in those with such a tendency, as in infants, we can see that the tendency is by no means at an end with the teething period.

Predisposing causes.—While much has been said and written on this subject, daily evidence goes to show that insanitary conditions under all circumstances, and understood as applying to every state and stage of human existence are the largest factor in the causation of consumption.

Amongst other influences we have those of heredity.

Popular and professional opinion have both, until recent years, accorded to heredity the principal exciting cause of consumption; but the most scientific teaching of the present day is that all that is inherited, is a tendency due to imperfect development, not of the organism in its gross or composite form, but of the structural or cell elements of its tissues. It will be manifest that if the delicate mother has a child weak at birth, it is probable in the very nature of things that it will be imperfectly nourished by her, and the innate tendency will rather be developed than lessened. That this is true seems to be borne out by the fact of the enormous numbers of children dying within the first year or two of birth from tuberculosis of the intestinal tract and neighboring glands.

Cornil has shown that the bacilli are taken into the system, without any necessary abrasion of the mucous membrane; and that the intestinal tract should be the common avenue of infection in children will be accepted without discussion.

Again, according to Hirsch, "Smith has ascertained for one thousand persons treated for consumption at the Brompton hospital, that seventy per cent. of them had been in the habit of spending their time in overcrowded, hot and dusty places indoors.'" "The same circumstances seem to account for the strikingly common occurrence of phthisis in nunneries, seminaries and such institutions, in evidence whereof a number of observations have been brought forward by Foucault." Amongst the latest of such observations are those of Cornet of Berlin. For the purposes of study he has taken the statistics of mortality from twenty-eight of the cloisters of Germany during 25 years, including brotherhoods and sisterhoods having an average population during these years of 4,028.28. The members of these sisterhoods had for the most part devoted themselves to the duties of nurses. He found that the life-period of each inmate amounted to a total of 87,450 years, or an average life-period of 21.6 years. The total deaths were 2,099 and 1,320 were of persons who died of tuberculosis. In one sisterhood having a yearly average of 37 persons there were during 22 years 10 deaths, all of which were due to tuberculosis. He further found, as seen in the following table, that the mortality in especially the several first quinquennia of conventual life, during which the sisters were especially engaged in the more menial duties of cleansing floors, washing clothes, etc., as compared with that of the whole state was relatively enormous. From these figures he draws the conclusion that a healthy girl entering a sisterhood at seventeen dies 21.5 years earlier than her sister belonging to the general population of the state; and that such an inmate in her twenty-fifth year stands in regard to expectation of life in the same class as a female in the outer world at the age of fifty-five, and a sister of thirty-three in the same class as a female outside at the age of sixty-two.

Number of Deaths from Tuberculosis per 1,000 Population in Cloisters in Germany during 25 years.

	Age-periods.						
	15-20	20-25	25-30	30-40	40-50	50-60	Over 60.
Deaths from all causes in—							
State	4.83	6.83	8.13	10.60	14.39	23.87	55.68
Hospitals and cloisters	20.46	21.67	23.94	19.48	15.00	19.30	58.41
Deaths from tuberculosis in—							
State	1.86	2.99	3.60	4.18	4.79	6.61	7.30
Hospitals and cloisters	11.69	13.73	17.62	14.21	8.88	4.73	8.88
Number of deaths from tuberculosis to every 100 deaths in—							
State	37.86	43.01	43.56	39.38	32.78	26.89	17.88=23.78
Hospital and cloister	60.87	67.49	73.73	73.84	57.93	28.67	19.00=62 89

Finally it may be stated that in the Report of the Inspector of Prisons and Public Charities in Ontario for 1890, where the public institutions have by all observers received high commendation, the aggregation of population would seem to produce similar results. Thus of a total population in the insane asylums amounting to 3,500, having 231 deaths or 65 per 1,000, there were 29 due to phthisis, *i. e.*, 12 per cent. of the whole or 8.28 per 1,000 of the population.

Influence of Infection —The influence both of hereditary tendency and of infection is similarly acutely illustrated by statistics taken from Ontario death returns in the three old-settled counties of Prince Edward, Welland and Lincoln, during a period of eleven years. The total deaths from consumption are given in each case, and the number of persons of the same name dying from the disease in successive years are indicated by numerals instead of the names being given.

Deaths from Consumption during 11 years in three Ontario Counties.

Counties.	Total No. of deaths.	Total names.	Total names repeated.	Per cent. of whole deaths occurring of names repeated.	Average number of times each name is repeated.	Total names occurring in the same year.	Percentage of total number of deaths from all causes during 11 years.
				per cent.			
Welland	404	285	71	25	2.67	In 1 case four occurred	10.21
Prince Edward	330	198	86	43	2.53	In 3 cases three "	11.3
Lincoln	450	330	195	43	2.6	In 23 " two "	9.9
						In 22 " " "	
						In 2 " three "	
						In 30 " two "	
						In 1 case three "	

Deaths from Consumption in the Ontario Counties of Prince Edward, Welland and Lincoln during the years 1881 to 1891 in cases where deaths of persons of the same name occurred twice or oftener, and the years in which such occurred.

PRINCE EDWARD.

Family name represented by a numeral.	Total No. of times it occurred.	Year or years in which deaths occurred.	Family name represented by a numeral.	Total No. of times occurred.	Year or years in which deaths occurred.
1	2	1884:1 1888:1	45	2	1881:1 1890:1
2	2	1885:1 1886:1	46	2	1881:1 1890:1
3	2	1885:1 1887:1	47	2	1881:1 1890:1
4	2	1885:1 1889:1	48	2	1881:1 1887:1
5	2	1885:1 1886:1	49	2	1881:1 1884:1
6	2	1885:1 1886:1	50	2	1881:1 1882:1
7	2	1885:2	51	2	1881:1 1890:1
8	2	1885:1 1886:1	52	2	1881:1 1887:1
9	2	1886:1 1888:1	53	3	1884:1 1885:1 1886:1
10	2	1886:1 1889:1	54	3	1885:1 1890:2
11	2	1886:2	55	3	1885:1 1886:1 1888:1
12	2	1886:1 1891:1	55	3	1882:2 1883:1
13	2	1886:2	56	3	1882:2 1884:1 1890 1
14	2	1883:1 1884:1	58		1883:1 1884:1 1887:1
15	2	1883:2	59		1883:1 1890:2
16	2	1883:1 1891:1	60	3	1883:2 1886:1
17	2	1883:1 1887:1	61	3	1883:1 1884:1 1891:1
18	2	1884:1 1888:1	62	3	1884:1 1885:1 1886:1
19	2	1884:1 1885:1	63	3	1889:1 1890:1 1891:1
20	2	1887:1 1888:1	64	3	1882:3
21	2	1887;1 1890:1	65	3	1882:2 1885:1
22	2	1887:1 1889:1	66	3	1882:1 1888:1 1889:1
23	2	1888:1 1890:1	67	3	1882:1 1885:1 1886:1
24	2	1888:2	68	3	1881:1 1882:1 1885:1
25	2	1888:1 1890:1	69	3	1881:1 1882:1 1886:1
26	2	1888:1 1891:1	70	3	1881:1 1885:1 1891:1
27	2	1889:1 1891:1	71	3	1881:1 1886:1 1888:1
28	2	1889:1 1891:1	72	3	1881:1 1887:1
29	2	1890:1 1891:1	73	3	1881:1 1885:1 1890:1
30	2	1890:2	74	4	1885:1 1886:1 1889:2
31	2	1881:1 1890:1	75	4	1881:1 1882:1 1884:1 1887:1
32	2	1881:1 1884:1	76	4	1882:1 1885:2 1891:1
33	2	1882:2	77	4	1881:2 1889:1 1885:1
34	2	1882:1 1883:1	78	5	1882:1 1883:1 1884:2 1888:1
35	2	1882:1 1889:1	79	5	1881:2 1886:1 1887:1 1891:1
36	2	1882:1 1891:1	80	6	1882:1 1890:1 1884:1 1885:1
37	2	1881:1 1889:1			1887:1 1889:1
38	2	1882:1 1885:1	81	6	1882:2 1886:1 1888:2 1890:1
39	2	1882:1 1887:1	82	7	1882:3 1883:1 1885:1 1888:2
40	2	1882:1 1884:1	83	8	1881:1 1882:1 1883:2 1886:1
41	2	1881:1 1891:1			1888:1 1889:1 1890:1
42	2	1881:1 1888:1	84	11	1881:1 1883:2 1885:1 1886:1
43	2	1881:1 1884:1			1888:3 1889:1 1891:2
44	2	1881:1 1884:1			

WELLAND.

Family name represented by a numeral.	Total No. of times it occurred.	Years.
85	2	1881:2
86	2	1881:1 1886:1
87	2	1881:1 1890:1
88	2	1881:1 1889:1
89	2	1881:1 1885:1
90	2	1881:1 1885:1
91	2	1881:1 1884:1
92	2	1881:1 1885:1
93	2	1881:1 1882:1
94	2	1881:1 1891:1
95	2	1881:1 1890:1
96	2	1881:2
97	2	1882:1 1886:1
98	2	1882:1 1887:1
99	2	1882:1 1885:1
100	2	1882:1 1883:1
101	2	1882:1 1886:1
102	2	1882:1 1885:1
103	2	1882:1 1885:1
104	2	1882:1 1884:1
105	2	1882:1 1884:1
106	2	1885:2
107	2	1885:1 1887:1
108	2	1884:1 1888:1
109	2	1884:1 1885:1
110	2	1885:1 1891:1
111	2	1886:2
112	2	1892:2
113	2	1891:1 1889:1
114	2	1891:2
115	2	1889:2
116	2	1882 1889
117	2	1883:1 1890:1
118	2	1883:1 1884:1
119	2	1885:1 1890:1
120	2	1883:1 1889:1
121	2	1883:1 1884:1
122	2	1883:1 1885:1
123	2	1883:1 1886:1
124	2	1884:1 1890:1
125	2	1884:1 1890:1
126	2	1884:2
127	2	1886:1 1888:1
128	2	1886:1 1889:1
129	2	1887:1 1890:1
130	2	1887:1 1890:1
131	2	1887:1 1890:1
132	2	1890:2
133	2	1890:2
134	2	1891:1 1889:1
135	3	1881:1 1882:2
136	3	1881:1 1888:1 1890:1
137	3	1881:1 1887:1 1890:1
138	3	1882:2 1885:1
139	3	1882:1 1888:2
140	3	1882:1 1884:1 1890:1
141	3	1882:1 1884:1 1886:1
142	3	1882:1 1886:1 1890:1
143	3	1882:2 1887:1
144	3	1885:1 1886:1 1887:1
145	3	1883 1888 1889
146	3	1884 1885 1887
147	3	1884:1 1885:1 1886:1
148	3	1887:2 1890:1
149	4	1881:1 1885:1 1886:1 1889:1
150		1886:2 1889:1 1891:1
151	4	1883:1 1887:1 1888:1 1890:1
152	4	1887:2 1889:1 1890:1
153	5	1881:1 1887:2 1890:1 1891:1
154	5	1885:1 1886:5 1891:1
155	6	1882:2 1883:1 1884:1 1885:1 1887:1
156	6	1885:1 1886:1 1887:1 1888:3
157	7	1882:1 1885:1 1888:4 1889:1
158	10	1881:2 1883:1 1884:1 1887:2 1888:1 1889:3

LINCOLN.

Family name represented by a numeral.	Total No. of times it occurred.	Years.	Family name represented by a numeral.	Total No. of times it occurred.	Years.
159	2	1881:1 1883:1	192	2	1886:2
160	2	1881:1 1887:1	193	2	1886:1 1891:1891
161	2	1881:1 1887:1	194	2	1886:2
162	2	1883:1 1889:1	195	2	1886:1 1891:1
163	2	1883:1 1890;1	196	2	1886:1 1891:1
164	2	1883:1 1890:1	197	2	1886:1 1888:1
165	2	1883:1 1884:1	198	2	1886:1 1890:1
166	2	1883:1 1888:1	199	3	1883:2 1886:1
167	2	1883:1 1885:1	200	3	1882:1 1884:1 1887:1
168	2	1883:1 1888:1	201	3	1883:1 1888:1 1890:1
169	2	1883:1 1885:1	202	3	1881:1 1889:2
170	2	1881:1 1887:1	203	3	1881:3
171	2	1881:1 1883:1	204	3	1881:1 1886:1 1888:1
172	2	1881:1 1886:1	205	3	1881:1 1886:1 1887:1
173	2	1881:1 1887:1	206	3	1884:1 1886:1 1890:1
174	2	1884:2	207	3	1885:1 1886:1 1889:1
175	2	1884:1 1888:1	208	3	1885:1 1886:1 1887:1
176	2	1884:1 1888:1	209	3	1886:1 1890:1 1891:1
177	2	1884:1 1889:1	210	3	1886:1 1887:1 1891:1
178	2	1884:1 1888:1	211	4	1881:2 1883:2
179	2	1890:2	212	4	1881:1 1885:1 1886:1 1887:1
180	2	1890:2	213	4	1881:2 1887:1 1890:1
181	2	1885:1 1889:1	214	4	1884:1 1890:2 1891:1
182	2	1885:1 1888:1	215	4	1884:2 1886:1 1888:1
183	2	1885:1 1890:1	216	4	1886:1 1889:2 1891:1
184	2	1885:1 1887:1	217	5	1883:1 1888:2 1889:2
185	2	1885:1 1887:1	218	5	1881:1 1883:1 1887:1 1888:1 1891:1
186	2	1886:1 1889:1			
187	2	1886:2	219	5	1884:2 1886:1 1888:2
188	2	1886:2	220	5	1884:1 1885:1 1886:1 1890:2
189	2	1886:1 1889:1	221	6	1884:2 1885:2 1886:1 1887:1
190	2	1886:1 1890:1	222	7	1881:2 1884:1 1886:1 1887:2 1891:1
191	2	1886:2			

Setting forth therefore the conclusions based upon these studies it may be said :

1. That we must recognize the disease tuberculosis as being beyond question a contagious disease belonging to the category wherein are placed glanders and leprosy.

2. This being true beyond question, the attitude which must be assumed by officers of health is to treat it as such, and hence they must examine into what practical measures are to be taken for preventing it and, so far as possible, limiting its dissemination from those centres where they find it existing.

3. Arguing by inferences fairly drawn from the numerous statistics already presented, we must primarily regard the question of dealing practically with the problem as being one which appeals to the active sympathies of every one, whether as an individual, a physician or a health officer.

4. This means that the extinction of phthisis must be looked for by our dealing with it as with diphtheria and other diseases of its class, and hence we must endeavor—

(*a*) To prevent it by removing the causes which promote it.

(*b*) By so regulating the habits and lives of those affected with it, as to prevent them from becoming sources of infection to the healthy.

(*c*) By the establishment of hospitals and sanitaria where those infected may have the best possible opportunities of being cured of the disease.

Referring to these points in their order as regards the prevention of the disease we must look to the private life or family home of the people.

Here the matters specially to be enquired into are :

1. The removal of dampness, both under and around houses, as also the removal of all wood or other organic matter tending to decay or promote fungoid growth.

2. The establishment of efficient and complete plumbing and drainage.

3. The introduction of a pure water supply.

4. The maintenance of purity of the atmosphere of the house, by cleanliness, ventilation and the abundance of sunlight.

5. Proper and equable heating of living rooms.

6. Attention to the clothing of people, whether in the house or out of it. It must be clean, non-conducting and sufficient.

7. The use of nutritious and wholesome food, notably of animal foods, as meat and milk, etc.

These considerations require that we follow the people to :

The school, and see that those desiderata required for the healthy home be had in the school ; the work-room and shop where there is the constant difficulty of overcrowding and uncleanliness ; their trade or occupation, notably to our woollen factories, where animal materials are handled ; the works where stone-cutting, grinding, etc., are carried on, and to those where effluvia and poisonous particles are given off, as in painting, card-glazing, arsenical manufacturing, etc.

In these directions indeed, our labors must simply be neverceasing, for dangers to health are almost as multifarious as the different industries carried on.

We have next to supervise the municipal home of the people :

Here we have to deal with the large problem of municipal sanitation. This means (*a*) town drainage ; (*b*) town sewerage ; (*c*) town paving ; (*d*) public waterworks ; (*e*) inspection of filth nuisances ; (*f*) compulsory notification of cases of consumption.

Referring especially to that phase of this problem, which ought and can be dealt with at once, since we have the matter wholly under the control of physicians and boards of hospital trustees, it is of interest to examine the few available data in connection with the hospitals in Ontario. These are public institutions supported by government grant, municipal funds and private subscriptions and by individual benevolence.

By reference to the Annual Report of the Inspector of Public Charities for 1892, it is found that there were returned from the various hospitals in Ontario 11,404 cases as admitted, and that of these there were 11,008 suffering from various enumerated diseases, leaving 396 of which no record is given. An analysis of these diseases gives the following :

Caries	127	Tuberculosis of joints	19
Necrosis	74	Tuberculosis of glands	4
Rickets	12	Chronic bronchitis	196
Synovitis	40	Tuberculosis	353
Hip joint disease	78		

Under tuberculosis, are included diseases returned as hæmoptysis, laryngeal tuberculosis and tubercular phthisis. In addition to the above list of pneumonic diseases there were 197 cases of acute bronchitis, and 277 of pneumonia. Of course it is impossible to state how many of the latter proved to be tubercular, but we may fairly assume that there were at least as many tuberculous cases as are included in the above list. Of these the first six classes amounting to 350 cases may be considered as not being infectious under ordinary conditions, while the latter three classes, including 353 cases of tuberculosis, may be considered as being more or less infectious. In other words, 5 per cent.

of the total inmates of our hospitals suffered from this contagious disease. This would mean that there would be one infectious tuberculous case for every ward of twenty beds. Doubtless most of these cases were charity patients, as it is not a common occurrence for the well-to-do tuberculous patient to go to an hospital for treatment.

As yet there is not in the whole Province an hospital for consumptives, and special wards are not, as my information goes, specially assigned to this class of sufferers. If this be true then it is apparent that patients sick from other causes and placed in wards with consumptives may become infected if infectious tuberculosis be present. Unfortunately the report gives no details as to the length of time during which these patients remained in hospitals; but it may be assumed that many were there for months during the later stages of the disease. Patients suffering from other diseases could in some instances be exposed for considerable periods to whatever contagion was present. Regarding the presence of such contagion we are not without experimental evidence. Prof. Cornet, of Berlin, has found the bacillus of tuberculosis in the dust of wards for consumptives in hospitals, in the dust of rooms in which consumptives live, and in the dust of railway carriages conveying many consumptives to the health resorts of the Riviera.

Perhaps, however, we may form some idea of these contagious influences from the statistics which already have been given regarding the excessive mortality amongst the nursing sisterhoods in Germany. As to the positive influence of residence in wards of hospitals where the tuberculous patients are present, we would seem to have positive proof in the following table taken from the returns of deaths in the Asylums for Insane of Ontario during 1892. While these are imperfect so far as the age at which patients entered these institutions is concerned, and while it may be assumed that those entering during the year were younger than those present for the longer periods and therefore rather more susceptible to any existing contagion, yet the difference of one or two years of age is wholly insufficient to explain the enormously increased percentage of those dying from tuberculosis to the total deaths during any year. It will not of course be forgotten on the other hand that the debilitating effect of confinement due to mental disease must tend to make the physical system less resistent to any specific contagion present.

Table giving the total Deaths in Ontario Asylums (exclusive of Mimico) during 1892 from Tuberculosis in a population of 4,231, the total Deaths from all causes being 211.

Period of residence.	Total deaths.	Deaths from Tuberculosis.	Percentage of total deaths.
Under 1 year	72	7	9.7
Between 1 and 2 years	25	5	20.0
" 2 and 3 "	40	9	22.5
" 5 and 10 "	19	10	52.6
" 10 and 15 "	16	6	37.5
" 15 and 20 "	15	2	13.3
Over 20 years	24	2	8.3
Total	211	41	23.4

But it is not alone in public institutions that these malign influences produce their deadly effects. If the table of deaths in the three old Ontario counties be examined, the influence of propinquity is equally evident. While it may be urged that owing to patients in asylums or hospitals suffering from some other disease, they merely have their resistance to the infection of consumption reduced, yet it cannot be said that heredity in such instances is enough to account for the excessive mortality from consumption; in these institutions it was, doubtless, in many instances, due to direct contagion. On the other hand if heredity play its role in certain county families it cannot be said that other diseases have lessened resistance in such to infection. Thus, in Prince Edward county, out of 198 names, 86 are repeated 2.53 times; in Welland, of 285 names 71 are repeated 2.67 times; and in Lincoln, of 330 total names 195 are repeated 2.6 times.

Examine the problem as we may infection appears as the dominating influence. What is being done or what is possible to avert the efforts of this malign influence? What appears at once a partial solution of the hospital and asylum problem is the isolation in certain wards, or better still, in certain buildings of all tuberculized patients. There can no longer, if statistics teach us anything, be any hesitation in accepting the view of the contagious nature of the disease. Twenty-five years ago small-pox was treated in the wards of many hospitals. That day is past. To-day diphtheria and scarlatina no longer find easy entrance in this Province to the wards of general hospitals, and then only to be treated in isolated apartments. It does not seem possible to longer delay the question of isolation wards for consumptives, and the construction of homes for consumptives. Regarding this latter matter public sentiment needs only to be aroused, and some way to the attainment of the end pointed out, when doubtless the means will be found. The results of sanitaria in certain elevated climates in the treatment of consumptives are now known to all physicians. The dryness of the atmosphere, the open air life, the exercise and attention to hygiene are the well known elements in effecting a cure or prolonging life. The essential differences between house atmospheres and external air have been in the previous pages of this Report demonstrated and dwelt upon in many tables and in many experiments. Shall it not be possible to bring these conditions within the reach of our own citizens? The relative freedom of the central plateau of Ontario has already been referred to; but the following table of deaths in several upland districts even in the County of York further illustrates the fact.

Deaths from Tuberculosis in Whitchurch, Vaughan and King Townships, County of York for the 5 years, 1888-92.

Population.	Total Deaths.	Total family names.	Deaths per 1,000 per annum.
4,019	11	11	.54
6,067	25	20	.80
5,292	16	15	.60

We have, as already stated, a yearly mortality from tuberculosis in Ontario, greater than from any other single cause amounting in 1891 to 734 or 2.0 per 1,000 of the population. We have thousands of persons now suffering from tuberculosis in as many houses in Ontario; we have in crowded work-rooms and in every factory valuable adult lives daily exposed to the irritating influences on the respiratory tract of the dust in these factories, to which is added the fatal virus from many tuberculized fellow-workpeople, and we have in the very measures taken by the state and municipalities for the alleviation of suffering, vehicles for the further transmission of this fatal malady. Why should the matter remain thus? In many of our progressive counties, intelligent legislators, aided by benevolent citizens, have undertaken in a systematic manner to find *Homes for the Poor.* In Ontario in 1891 there were nine county poor-houses receiving Government aid, and supported by the counties to the extent of $177,500 in value, and taking care of 527 persons, as seen in the following table:

Houses of Industry in Ontario in 1891.

Total number of counties in 1891.	Total acreage in industrial farms.	Average acreage.	Total value of buildings and property.	Average value of buildings and property.	Total number of inmates.	Average number per county.
9	586	65	$177,500	$18,722.22	527	58.55

Substantial buildings have been erected, farms have been bought and donated and facilities have been supplied for enabling these poor not only to live healthful lives, but by their labor to aid in maintaining themselves.

For an infinitely more deserving class, found in every grade of society, the young, the beautiful and unfortunate, can we do nothing? It cannot be! Society and the state look to those who have devoted their lives to the amelioration of human suffering and the drying of tear-dimmed eyes for help and guidance in this matter. The medical profession and sanitarians, whether professional or engaged in the everyday practice of this modern religion, are, by such a melancholy story as that told in the foregoing statistics, called upon to lead the crusade against the one foe, which from earliest historic times has found his easy victims in every home and in every class of society; that has wasted most the strength of the wage-earner whose labor was demanded for the support of those who in their holy devotion to him in the losing struggle of his waning life, have soothed his dying hours only to find themselves following as easier victims to the appetite of this insatiate monster, who yearly from a thousand homes steals the fairest and loveliest—readiest victims at the moment when budding youth is blooming into fairest manhood and womanhood. We dream not of his complete destruction so long as the bitter struggle for life makes many to bow under their Atlantean burden; we cannot believe that the enervating influences which dissipate the strength of youth will ever fail to produce their legitimate and bitter fruit, nor that society as a whole can be so highly enlightened as to know or knowingly follow the path by which the hidden dangers from this insidious foe can be averted; but we do hope that from year to year the prayer of Tennyson, "Let knowledge grow from more to more," may in some degree find its realization in practical measures, which have been so fully shown to be successful in lessening the dangers which flow from a disease which is the bane of humanity from infancy to old age. By succeeding in this work we shall best fulfil the maxim, "*Angustis hunc addere rebus honorem.*"

P. H. BRYCE.

PART II.

I. THE CHAIRMAN'S ANNUAL ADDRESS.

By J. J. Cassidy, M.D., Toronto.

To the Members of the Provincial Board of Health :

Gentlemen,—To day, the most striking fact in the sanitary world is the deep seated and universal dread of cholera, both in Europe and America. The daily papers, the literary magazines, the medical and health periodicals are incessantly full of this topic—the people will not, then, be asleep. Fortunately they are ready and willing to follow their sanitary advisers to the fullest extent. In our own country, this year, the Federal Government has taken a forward step, by assembling at Ottawa a conference of heads of Provincial Departments and sanitary experts, in order to consider the relations between Dominion and Provincial sanitation, and to recommend any necessary improvements in the quarantine of Canadian maritime and inland ports. The conference met in the Department of Agriculture at Ottawa, January 31, at 2 p m., the following gentlemen being present: Mr. Lowe, Deputy Minister of Agriculture, representing the Federal Government; Hon. J. M. Gibson, Hon. R. Harcourt and Hon. Mr. Bronson, representing the Provincial Government of Ontario; Hon. L. P. Pelletier, the Provincial Government of Quebec; Hon. James Mitchell, the Provincial Government of New Brunswick; Hon. Senator Macdonald and Mr. L. H. Davies, M.P., the Provincial Government of Prince Edward Island; Dr. Cassidy, Chairman Provincial Board of Health, Ontario; Dr. Bryce, Secretary; Dr. Lachapelle, Chairman Provincial Board of Health, Quebec; Dr. Pelletier, Secretary; Dr. O'Donnell, Manitoba; Dr. Davies, British Columbia. Nova Scotia was unrepresented. Dr. Montizambert, Medical Superintendent of the Grosse Isle Station, was present at the request of the Minister of Agriculture. The work of preparing a report, showing the duties and responsibilities to be assumed respectively by the Dominion and Provinces, in the matter of taking precautions against, and dealing with any threatened invasion of Asiatic cholera was entrusted to the following committee: Dr. Cassidy, Dr. Bryce, Dr. Lachapelle, Dr. Pelletier, Hon. Mr. Mitchell, Dr. O'Donnell and Senator Macdonald, with instructions to report to the conference next morning at 10 a.m. This was done and the report of this committee was adopted at the ensuing session of the conference, February 1st.

At this meeting Hon. Mr. Angers, Minister of Agriculture, was present and presided.

This concluded the work of the conference, with reference to preparing defences against cholera. A special session was, however, devoted to considering the best means of providing for the collection, compilation and publication of the vital statistics of the Dominion. The conclusions arrived at by the conference on this important subject form part of the report. The report of the sub-committee, which was adopted by the conference, is as follows:

"1. That the following maritime quarantine stations, namely, Grosse Isle, Halifax, St. John and William's Head, should be equipped with deep-water wharves, steam cylinders, tanks for bichloride of mercury solution, sulphur dioxide blasts, suitable water supply, hospital and accommodation buildings for the detention of the various classes of passengers, and with such other requirements as pertain to first-class stations, and that Chatham, New Brunswick, be also equipped with all the appliances necessary for a quarantine station on the Gulf coast.

"2. That, in the opinion of the committee, it is necessary that provision be made, whereby quarantine inspection, by properly trained medical officers, be established at

Rouse's Point, St. Alban's, Niagara Falls, Ontario, McAdam's Junction, and such other ports of entry from the United States, as may be decided upon as necessary, according to circumstances ; and that such ports of entry be equipped with disinfecting plant, houses of detention, and such other appliances, as may be necessary for efficiently protecting the country, against the invasion of cholera. Further, that at Winnipeg, the *entrepot* of immigrants east and west, a fully equipped quarantine station be established and maintained.

"3. That, in the opinion of the committee, it is urgent in the public interest, that the supervision of the various quarantine stations be under the charge of an experienced quarantine officer, appointed by the Federal Government, who shall direct such quarantine measures as the emergency shall demand for the protection of the country ; and who shall, from time to time, inspect such stations, with a view to maintaining them in a state of efficiency.

"4. That, in the case of vessels coming from foreign ports, they shall report for medical inspection before receiving customs entry. Should infectious disease have occurred during the voyage, or cases of infectious disease be found on board, the medical officers appointed by the Government shall order the said vessel to report for inspection and disinfection at the nearest quarantine station.

"5. That, in the opinion of the committee, it is necessary for the safety of Canada that the baggage of every immigrant coming into this country during periods of foreign epidemics, be disinfected by the methods already recommended by the committee, and that such disinfection be performed at a regularly appointed station.

"6. That vessels coming from infected European ports, no cases of infectious diseases having occurred on board during the voyage, should be thoroughly disinfected at a regular quarantine station.

"7. That vessels, having had cholera on board during the voyage, should be disinfected and detained at quarantine during seven days from date of last case.

"8. That in the opinion of the committee, it is necessary, during epidemic periods, that immigrants be followed to their destination. That this can be done, by the Government insisting that every shipping company shall provide each immigrant, while on shipboard, with a health ticket of form satisfactory to quarantine and provincial health officers, which shall be a passport of health to the point of destination, and be accepted by officers wherever inspection takes place. All municipal health officers should also be notified of any immigrants arriving within their districts, by letter, or by telegram, from the quarantine to a provincial or state health officer.

"9. The following rules do not apply to immigrants, who are provided for elsewhere :

"(*a*) When a train arrives at the railroad station, and the passengers do not come from a place where disease is epidemic, they will be allowed to proceed.

"(*b*) When passengers are not sick, but come from an infected place, their soiled clothing will be disinfected and they will be allowed to proceed, on condition that they report to the clerk of the municipality to which they are bound. The quarantine officer will notify said clerk, and also the Provincial Board of Health.

"(*c*) When there are passengers sick, or apparently sick from an infectious disease, they will be landed at the infectious disease hospital. Passengers occupying the same car will be detained for forty-eight hours, and the effects which they brought on the same car will be disinfected. They will then be released, on condition that they report to the clerk of the municipality to which they are bound. The quarantine officer will notify such clerk, and also the Provincial Board of Health.

"(*d*) Passengers travelling through Canada, with no intention of remaining in the country, who are only suspected of having infectious disease, will be allowed to proceed to their destination, the quarantine officer notifying the Provincial or State Board of Health to which they are bound.

"(*e*) The cars, in which there have been sick persons, shall be disinfected.

"(*f*) Cars, coming from an infected district, will have to be provided with latrines, containing disinfectants.

"10. Should the United States Government adopt a twenty days' quarantine against cholera in 1893, the Federal Government of Canada should enforce the same rule against

immigrants, who may wish to travel from European ports through Canada to the United States.

"11. When cholera is epidemic abroad, the importation of rags from, or collected in, infected countries should be prohibited.

"12. Cars containing merchandise, which is susceptible of infection, (baggage, wearing apparel, rags, hides, leather, feathers, horse hair, animal remains in general, unbaled manufactured wool, etc), coming from an infected district, should be properly disinfected."

It was moved by Dr. Bryce and seconded by Dr. O'Donnell, that the report as read be adopted. Carried.

At a subsequent meeting held at 8 p.m., February 1st, it was moved by Dr. Cassidy and seconded by Dr. Pelletier: "That the report of the sub committee be amended by adding to it certain resolutions containing further recommendations." Carried.

Moved by Dr. Bryce and seconded by Dr. O'Donnell, "That in the opinion of the conference, it is urgent that the various provincial health organizations do carry out thoroughly the work of municipal inspection with regard to: (*a*) The protection of public water supplies. (*b*) The systematic disposal of garbage. (*c*) The disposal of manure and lane and road refuse. (*d*) The cleansing of polluted creeks, bays, etc., in the various municipalities along the lines of railway and elsewhere, and those municipalities be required to supply medical officers, places of detention and disinfecting appliances to render innocuous any cases of cholera, which may occur within provincial jurisdiction." Carried.

It was moved by Dr. Cassidy, and seconded by Dr. Pelletier, "That the conference urge upon those provinces having no Provincial Boards of Health, or other official health organization, that their legislatures do take early action towards passing legislation providing for the establishment of such boards, both for their own protection and that of neighboring provinces." Carried.

It was moved by Dr. Bryce and seconded by Dr. Cassidy, "That a copy of the report of the proceedings of the conference be furnished to each of its members and also to the several Provincial Governments represented." Carried.

The conference then dissolved.

The Federal Government has already intimated what course it intends to pursue, with regard to these recommendations. I may say there is good reason to hope, that nearly all of them will be carried into effect.

The Board will remember that, at a special meeting held on September 17th, 1892, certain regulations in the matter of cholera were adopted, which were afterwards passed by Order-in-Council. Your committee on legislation desires to report on these regulations and to ask you to consider the advisability of making certain amendments. The text of the former Order-in-Council and the proposed amendments will be laid before you for your consideration. Another important matter, which will claim your attention, will be the revision of Pamphlet No. 15, entitled, "Rules for Checking the Spread of Contagious and Infectious Diseases."

The committee on publication has revised this pamphlet, and the text of the work, together with the proposed amendments, will be submitted for your consideration.

The committee on publication has further revised, and will present for the consideration of the Board the pamphlet on Disposal of Sewage.

Recognising as we do, the imminent danger that is present in the use of sewage-polluted water, and the readiness with which it becomes charged with the comma bacilli, we cannot but look with positive dread at the condition of Toronto's city water supply. Viewed in the light of the epidemic at Hamburg last summer, one would almost say that the municipal authorities of this city are trifling with the grave danger at their gates, instead of taking these well-known and efficient precautions, by which an inferior may be converted into a first-class water. The condition of the people of Toronto during this winter in the matter of water supply has been positively pitiable. One does not require to be fastidious to object to drinking "boiled sewage," and yet that is really the best water to be obtained in this city at the present time. Beside this, children and occasionally their elders, forgetful of the foul condition of the water, have taken it in its unboiled condition, and in numerous instances have been troubled with severe diarrhœa.

Typhoid fever is also increasing. Even if the pipe extending across Toronto bay is made tight, there is no guarantee that it can be kept so, and the Toronto water supply will therefore continue to be of a very uncertain or even dangerous character.

For protection from fire and mechanical purposes it is sufficient; but for potable purposes it is unfit. Under these circumstances, would it not be better for Toronto people to cease agitating for another supply, and to devote their energies and their money to the filtration of that which they have?

The experience gained elsewhere by observers and engineers, and in the laboratory of this Board, proves that by efficient filtration an inferior can be converted into a first class water. Witness the improvement in the water supply of St. Thomas, Ontario, owing to filtration through Hyatt filters.

In recommending the adoption of the Hyatt filters, I am well aware that to the general public, who may read these remarks, and to some professional men an explanation may be necessary.

It is now recognized that many filters, so far from separating the bacteria may even make the water richer in these organisms. This is due to the fact, that the filtering material, sand, etc., becomes charged with bacteria and not being cleansed gives them up to the water which is offered for filtration. The Hyatt system consists in the addition of a small quantity of alum for each gallon of water before filtration, thus clarifying it considerably by the formation of a precipitate. This precipitate, in falling, entangles and brings down with it the bacteria, so that they are more easily removed by filtration. The filtration takes place through sand contained in large horizontal cylinders, provision being made for the reversal of the stream of water once in 24 hours, so as to thoroughly cleanse the filters.

At page 31, Report of Provincial Board of Health for 1891, we find the following statement: "In St. Thomas there are two of these filters, each with a filtering capacity of 500,000 gallons, and they are at present putting in an additional one." The following are some of the results:

			Bacteria.
July	3rd.	Before filtration	45,000 per C. C.
"	"	After filtration	90 " "
Oct.	23rd.	Before filtration, average	1,240 " "
"	"	After " "	44 " "
		Pumping at the rate of 1,324,800 gallons per 24 hours.	
"	24th.	Before filtration 10.30 a m	1,240 " "
"	"	Water at 10.30 a.m. filtered through No. 1. filter, cleaned at midnight	59 " "
		Water at 10.30 a.m. filtered through No. 2 filter, cleaned at 10 a.m.	270 " "
		Mixed water at 11 a.m. filtered through both filters	65 " "
		Pumping at the rate of 810,720 gallons in 24 hours.	
"	26th.	Before filtration	1,545 " "
"	"	After filtration	70 " "
		Pumping at the rate of 794,880 gallons in 24 hours.	

The report goes on to say: "These results show a high degree of efficiency in the filters, as in the case of the examination of October 23rd, the pumps were sending water through the filters at a rate about $\frac{1}{4}$ as fast again as their capacity allows for good filtration."

How much better then, would it not be for us to have our water filtered, being thus quite secure and satisfied that no matter what conditions might supervene during the transmission of lake Ontario water while passing through Toronto's sewage laden bay, it would be delivered to the people after filtration in a condition of crystal clearness and absolute purity from pathogenic or saprophytic germs?

In the interests of the public health, however, it is necessary at the present juncture, that an engine be placed on the island sufficient to drive the lake water through the bay pipe, so that the pressure will be outwards and no bay water can be drawn into the supply through defect of the pipes.

It is also earnestly to be hoped, that the members of this Board, and of every Municipal Health Board of the Province will look closely into the condition of the water supply in their respective municipalities. It is quite certain that, excluding town water-

works, many wells through the land are in urgent need of cleansing. As an instance of this, I may mention that, recently, I treated several persons living near the city for severe diarrhœa. An examination of the well water used by them showed that it contained rather more salt than is found in Toronto city water. This salt was not natural to the water, but was most probably derived from some neighboring privies, or else from top dressing used on the land, finding its way into the source of supply. Prevention is better than cure. The services of the analytical chemist should be made use of, and if a potable water supply is found impure, a remedy should be found before the summer is upon us. Where the source of supply is unknown or merits suspicion, the simple precaution of boiling the water before drinking it, should always be used.

As an instance of the difficulty of controlling people in the matter of potable water, I may mention the following incident which has been recently reported from Berlin, Germany: "The report of cholera cases in a workingmen's lodging house, near Trotha on the Saale is confirmed, thus leaving no doubt that Saale water is the source of infection. Five men in the lodging house boasted that they would drink all the Saale water they wished, despite the orders of local authorities to the contrary. On Sunday they drank the water as it came from the river and to-day all five are prostrate with Asiatic cholera of the worst form. In view of their recklessness the Provincial Council has announced, that all persons wantonly disregarding hereafter the local sanitary regulations, especially those as to the use of Saale water, will be punished with imprisonment for a term not shorter than two months and not longer than five years. People in villages along the Saale have been warned, that the water should be used only after boiling.

It is also to be hoped that in every municipality throughout the Province, attention will be paid to the following points:

(a) A radical and frequent cleansing and disinfecting of all places found to require it.

(b) A systematic and careful house to house inspection by proper sanitary inspectors, which should be repeated during the summer, at regular and stated intervals.

Should cholera, in spite of maritime quarantine, penetrate into this Province, every municipality should, in addition to the general precautions already mentioned, provide an isolation hospital for the sick, and detention rooms, where those exposed to the disease may be observed for a few days. Next, however, to a thorough bathing of the bodies of immigrants, one of the most important defences against cholera, is a complete disinfection of their baggage and clothing. All articles of clothing or bedding, linen, cottons, woollens, silk, etc., which have been exposed to the poison of the disease, should be disinfected by steam. The recent trials of the McEvoy steam disinfector, which have been made in Toronto show that it is quite sufficient to accomplish the most thorough disinfection in a short time. Cities and towns, therefore, would do well to purchase these magnificent machines, they being just as necessary as isolation hospitals and detention houses. Large ones, such as those which will be used at Grosse Isle, might also be purchased by the Federal Government, and stationed at frontier points, so that articles requiring disinfection could be collected, sent on and returned after disinfection. Circumstances are constantly occurring in different parts of the world, to show that disinfection is done carelessly or not at all. For instance, November the 6th, 1892. Dr. H. Baker, Secretary of the State Board of Health, Michigan, informed Dr. John Kapp, M. H. O., Ann Arbor, that Herman Sager, his wife and four children, immigrants from Bremen on the steamship "Saale," on which a case of small-pox had developed during the voyage, were destined for Ann Arbor. January 27th, 1893, two months after Secretary Baker received notice from Dr. Unterkircher, M. H. O. of Saline, that four persons in the family of Henry Snider, of Pittsfield township, just south of Ann Arbor, were sick with small-pox, and that the disease was brought by Herman Sager and family, who arrived there about two months ago and lived with the Snider family; also, that Herman Sager had a mild case of variola, which was at first taken for chicken pox, as that disease was prevailing at the time. Notice was received of two outbreaks of variola in Ohio caused by immigrants on the same vessel, the "Saale." These three outbreaks came by immigrants through the New York quarantine, and from the length of time before the disease broke out it is certain that the infection must have been conveyed in baggage. It would certainly be in the public interest, if baggage and wearing apparel belonging to immigrants were

thoroughly disinfected by steam at the quarantine stations of this continent, before the owners would be allowed to take passage into the interior.

Now that the Canadian Federal Government is preparing to place large disinfecting plants at the several maritime ports of entry, it is to be hoped, that all immigrants entering this country will be obliged to cleanse their persons, and that their baggage will be so thoroughly steam-disinfected that there may be no reason to fear any evil results from their settlement in this country or their passage through it.

While referring to small-pox, it may be opportune to observe here, that this disease seems to be epidemic at present over a large part of the world. From Japan it was imported into British Columbia, where it is still prevailing. In Great Britain it has made headway. From the United States cases are reported at various localities. Individual cases of this disease will, of course, occasionally occur in the United States, or Canada, owing to the importation of the infection from the west, or the orient; but the neglect of vaccination and re-vaccination will be the principal factors in causing its spread. With small-pox, therefore, all about us, it behooves our Local Boards to see that all are efficiently protected, as it is much easier to keep the enemy out than to fight him once he has gained an entrance.

In making these remarks, I do not intend to belittle the beneficent results of isolation and disinfection. I simply mean to say, that, if vaccination and re-vaccination were universally practiced, small-pox would soon cease to exist, and it would not be necessary to resort to expensive, and often annoying means of defence in order to prevent its epidemic spread in this country.

II. REPORT AND EVIDENCE TAKEN BY COMMITTEE ON SEWERAGE AND WATER SUPPLY *RE* THE POLLUTION OF ACTON CREEK BY TANNERY REFUSE.

Preliminary Report re the Acton Tannery to the Local Board of Acton and the Tannery Owners, by the Secretary.

GENTLEMEN,—Having examined the tannery and the sources of the pollution of the Acton creek running through the several farms below, I desire, as requested, to make the following suggestions as being likely to greatly mitigate, or remove the nuisance caused by pouring the waste water from the tannery into the creek.

1. For systematically dealing with the waste water, it is desirable that its volume, to be treated, be made as small as possible, by turning directly into the creek the waters of the springs, and all other waters which do become contaminated.

2. Convey, as at present, the polluted water to the place where it is to be treated.

3. Have the area, at present used for allowing the grosser materials in the polluted waters to settle, or as much more as may be found necessary, made into a series of flat beds in a manner similar to that carried out in different places.

4. As to the extent of these required for performing the necessary work, it will depend on the volume of refuse water to be treated. But, in the meantime, I would suggest that the present area be first prepared for the reception of the sewage, by converting it into an oblong, flat bed, divided into three sections as in the following diagram.

The sides should be raised at least 18 inches above the level of the flat bed, and be made of planking, with present earth, or if preferred with good clay, so that they will be strong and impervious banks. The ground of each flat-bed should have a series of two-inch (2") tile drains laid at a depth of $2\frac{1}{2}$ feet below the level of the flat bed, and fifteen

N.B.—The peculiar nature and the importance of this subject, and the wide extent to which the evils of such pollution may spread, make it desirable that a knowledge of the facts be as widespread as possible. The evidence taken before the Committee and their conclusions are therefore printed in full. *Secretary.*

feet (15') apart. The ground, which is gravelly, should during the levelling, be all carefully ploughed and subsoiled, so as to be made as porous as possible. On the levelled surface one foot of pure, sharp sand (coarse) or fine gravel will then be hauled. It is of the greatest importance that this filtering material contains no clay.

5. The beds having been thus completed, they will be ready for the treatment of the sewage in the following manner: On flat-bed No. 1 turn the sewage of 24 hours, from the conduit by several gates and small carriers, which will deliver the sewage so as to evenly cover the whole filter-bed. Treat beds No. 2 and No. 3 similarly on the second and third days, returning to No. 1 on the fourth day, and so continuing the rotation. By this means each bed will have an intermittent filtration, and time to cleanse itself before being used again. It will filter the water rapidly downward, and run purified from the tile drains if they are kept above the clay.

6. On the side of the filter-beds towards the hill a deep ditch must be dug, so as to carry all rain and soakage from the hillside away from the fields to the creek direct.

7. Should it be found that the waste water has a notably acid reaction in the conduit, it will increase the rapidity and thoroughness of the purification, if the refuse water, before flowing on to the filter-bed, be carried into a tank where it can be treated with an amount of milk of lime, sufficient to neutralize the acid. A partial sedimentation will take place in the tank, from which the upper water can be allowed to flow to the filter-bed. A pair of tanks to be used alternately would be necessary in this case, since, from time to time the sediment would have to be removed. In the meantime, however, I think it will be found, if the filter-beds be carefully constructed, that they will be equal to the necessities of the case.

I forward you a copy of the annual report of this Board, in which the sewage farm at London Asylum, is reported upon in detail; as also papers bearing on this subject found in the report of the Health Officers' meeting at Owen Sound.

I have made these suggestions unofficially, in order that the matter complained of, by the owners of lands along the creek, may be arranged amicably with owners of the tannery.

Should there be a neglect on the part of the latter to take prompt and early action, the regular steps to be taken for the abatement of the nuisance, would have to be set in motion.

These are indicated in sections 64, 29, etc., of the Public Health Act, Chapter 205, R. S. O.

Of course actions for damages under common law, or an application for an injunction may be taken, but I trust that in a case, where the remedy can be so readily applied as in this, the suggestions I have made will prove sufficient.

I have the honor to be,

Yours truly,

PETER H. BRYCE.

Report of Evidence in the matter of an Outbreak of Anthrax amongst Live Stock in the Township of Esquesing and the Village of Acton, Ont.

The following evidence was taken in the Town Hall, Acton, on Friday, the 22nd of July, 1892, before Dr. E. E. Kitchen (presiding); Dr. J. D. McDonald and Mr. J. J. Mackenzie, representing the Provincial Board of Health of Ontario.

All the witnesses were examined under oath, and a full enquiry was invited by those having the investigation in charge.

Several maps were submitted, showing the course of the stream passing through the tannery premises, and which, it was claimed by some, had been polluted by refuse from the tannery being emptied into it.

Mr. Boyd, barrister, asked and received permission to examine witnesses for Messrs. Beardmore, owners of the tannery.

S. WEBSTER, M D., sworn : I am Reeve of the Township of Esquesing, and a member of the Local Board of Health. The Township of Esquesing is one of the municipalities of the County of Halton. The Village of Acton is in the Township of Esquesing, geographically, but it is a separate municipality. During the last three or four years there have been complaints made by the farmers in the locality between the Village of Acton, and I may say the Village of Stewartown, in regard to the condition of this stream now under consideration. They state that the water is very black in appearance, and that more or less slime, and greasy substances collect around the bank as the creek courses through the township ; and they claim that the water is unfit to be used for animals or for men.

Dr. KITCHEN : Do cattle drink of it ?

WITNESS : Oh, yes ; all the way down, they do. It is an important stream, and they make use of it, more or less, all the way from the tannery to Stewartown. There is a good fall in some places, although it is flat in others. There was no special action taken in regard to the matter, until last summer, when there was an unfortunate outbreak of disease amongst cattle, supposed to be anthrax. The Local Board of Health of Esquesing investigated the matter, as far as lay in their power, but knowing that the matter was in the hands of the Provincial Board of Health, they left it to that body to take such action as they deemed fit. At that time several farmers lost quite a number of cattle, which was a considerable loss to the agricultural industry. In addition to that, their remaining stock had to be almost isolated, as people were afraid to purchase milk, or butter, or buy the stock. Since that time I have not heard of any further loss from this disease.

Dr. KITCHEN : Do you know anything of the disease personally ?

WITNESS : I have always recognized that it was a dangerous disease, and have given necessary instructions as regards burial with lime, and some, I have had cremated. I prefer cremation. I do not know how many animals have been lost. None have died from anthrax for about a year.

Dr. KITCHEN : Were there any losses prior to that ?

WITNESS : Yes ; but I have no personal knowledge of them. It is claimed by men who have farms in the neighborhood of this tannery creek that their land has depreciated in value, as people are afraid to let their cattle drink of that water, owing to its appearance being against it. I do not know anything personally about it.

Dr. MACDONALD : Do you know when the first of these cases of anthrax appeared ?

WITNESS : I cannot give you any definite information in regard to that. I have lived in this neighborhood about 26 years. I have heard reports during that time, that cattle have died from anthrax above here, and also in the neighborhood of Guelph. I have occasionally heard of a cow dying along the banks of the Credit, but what has been the cause, I do not know for certain. However, there has been nothing in the way of an epidemic, until last summer. I had heard complaints, but never followed them up.

ARCHIBALD MCPHERSON, sworn : I am a farmer, and live on lot 26, 2nd concession of Esquesing. I am situated one lot from the tannery lots. I have been on this lot nine years as tenant, and during that time I have lost a considerable number of stock. I lost two horses, six head of cattle and three sheep, last summer. I never lost any prior to last summer, as I never let my cattle on these flats before that time. One of the horses and two or three head of cattle were dissected, and examined by Dr. Bryce, of the Provincial Board of Health. Part of the creek goes through my farm. I was renting Mr. Allan's farm for two or three years, and the cattle got on the creek. I never lost an animal until then. The man who was on Mr. Allan's farm before me, lost one occasionally for the past six or seven years. He did not say anything about the symptoms of the disease in these animals, but they died suddenly. The first animal I lost was a milch cow. They went off to milk her, and when they found her, she was dead. She appeared to be well in the morning, and was then milked, but she died that afternoon. Another cow died somewhat similarly, and the third animal I lost, was a horse. My boy went up after

the horses in the morning, and came, and said there was something wrong with the horse. I said "Turn him into the stable and leave him there." I went over to Mr. Lawson, the veterinary, and he said it was distemper. I took the horse over, and rubbed his chops with a liniment, and he gagged. The next morning I went to rub him again, and the moment I touched him he dropped. The lad came and said the beast was dying, and when I got in, the beast was dead. Dr. Bryce examined him, and the word he sent me back was, that it was anthrax. There was a swelling of the glands, and some discharge at the nostrils. The animal was not able to drink, or swallow. I did not notice anything else about him. I sent away the mate of that horse to my brother-in-law's, and the night I buried the first one I got word that that one was sick also. I buried the horse about six feet deep, on high land. I was authorized to get lime and put it over the top of them. I burned one of the cows by putting wood on her. The second horse got better. I attribute his recovery to fumigation of sulphur. Last summer was a particularly dry one. The creek floods the flats every spring, but I could not say how much. I did not let any cattle go on last spring, as I was afraid.

Dr. MACDONALD: Where did the cattle die?

WITNESS: I found the cows dead in the field. In the case of a two-year old steer, I noticed at night that she was sick, and I shut it in and left it all day, and never gave it a drink or anything. In the evening I offered it some water. It drank a patent pail full, and I got another pail of water, and it drank half of that. I left the pail near it, and next morning I found the animal dead, about three feet from the pail. I had almost forgotten that, a year ago last summer, I lost a steer. Mr. Lawson examined it, but did not know what was the matter. I have been working the same land this summer, but I do not let the cattle run. The horses were running out for only a week, when they died. They jumped over the low fence. They were only three times on the flats before they died. The cattle were on that land from the spring. The order of affection was first two cows, one or two sheep, then the horses, then the cattle. In burying the animals I dragged them along the ground, but after that I did not allow a beast to go there until it was plowed up.

To Mr. BOYD: I have lived here nine years last spring. I lived two miles below that place all my lifetime.

Mr. BOYD: Did you ever hear of a case of death before that?

WITNESS: No.

Mr. BOYD: You never heard of a similar case happening thirty years ago?

WITNESS: No; I was too young then.

Mr. BOYD: Did I understand you to say that the man who had this place before you took it had lost an animal?

WITNESS: Yes.

Mr. BOYD: What did he do with it?

WITNESS: He buried it there.

Mr. BOYD: Where were the animals you lost, buried?

WITNESS: On lot 26.

Mr. BOYD: Where did they die? On the flats?

WITNESS: No. 27 is the flats, and they died on 26. I lost one on the flats, but the others died on my land, after I had driven them from the flats. The one that died on the flats I left there; I did not bury it. I think it is there yet. We opened it there, as soon as I heard that it was dead. We never think of burying an animal here.

Mr. BOYD: Did any of your cattle die that were never on the flats?

WITNESS: No; I hadn't any.

Mr. BOYD: Had you any horses, or any other animals?

WITNESS: Not to my knowledge. I am not sure of it.

Col. Wm. Allan, sworn: I am not a farmer, but am owner of lot 27, 3rd concession of Esquesing, the lot through which the creek runs. I have rented the farm. There is no farm tenant on it. I am also agent for other farms affected by this enquiry. Mr. McPherson's, lot 26, the next farm except one; and Mr. Burns I also represent. I have lived here 33 years. I have personal knowledge of the loss of these cattle; I have seen them all. The first knowledge I had was, when a cow of my own died about 26 years ago. The animal was buried at the bottom of the hill. She was pasturing on that part of the flats where the lower tannery is; but that was before the tannery was built. I do not remember any of the symptoms. The cow was well in the night, but dead in the morning. I did not notice any more then until Mr. Hay, another tenant of mine, lost some cattle, five or six years ago. I did not see these animals, however. After that, two cattle of John Flynn's died last summer. A cow belonging to Mr. Stathem, baker, and one belonging to Mr. Lane, insurance agent, also died. Some of the cattle that died in the village, were taken away, but some of the others were buried on the hill just as you go on to the flats, The stream does not overflow as high as that. The cattle came home and died in the stable in the night. The cattle that died 26 years ago died with the same symptoms. I agree with the statement made by Mr. McPherson, the former witness.

Mr. Mackenzie: Do you remember the character of the pasturage 26 years ago?

Witness: It was very good then.

Mr. Mackenzie: Did you skin the animals?

Witness: No.

Dr. Kitchen: What is the general height of the overflow?

Witness: It will go about 10 or 12 feet from the creek; but sometimes more, especially near those trees. It soon runs off again. I have suspected that some of the deaths which occurred about five or six years ago, resulted from anthrax. We thought that the cows that died 26 years ago had been taken ill from pollution of the creek, but did not know of anthrax.

Mr. Boyd: What is the earliest record of deaths?

Witness: About 33 years ago; just about the time I came to Acton. I am not certain, for they were not mine.

Mr. Boyd: Do you know what was done with them?

Witness: I do not.

Mr. Boyd: The cattle you lost you buried here?

Witness: Yes.

Robert Dick, sworn: I am a farmer, and reside on lot 7, concession 7, Esquesing. I am a member of the Board of Health of the township. Complaints were made to the Board, a year ago last May, regarding the death of live stock. That was the first I knew officially about it. The then clerk of the township, Mr. Murray, said that several farmers had made complaints to him, and we called meetings to consider the matter. These complaints were regarding the pollution of the stream, but did not refer to disease of animals. We did not take any particular action at the first meeting, but after that we were notified of the fact that these cattle and horses had died. This was in the summer, about the latter part of June, or early in July. A committee, of which I was a member, was then appointed to investigate, and also to inspect the tannery. We came up here, and found that they were putting in filters, although the work was not then complete. We had communicated with the Board of Health, before we made that visit—the Provincial Board—and Dr. Bryce, the Secretary, had made a visit. I believe that Messrs. Beardmore themselves were superintending the filtering beds, but I understood that they were working according to the instructions of Dr. Bryce. The clerk had written already to Dr. Bryce, who had replied that he had left instructions about filtering beds, and that we should inspect them. We reported at the following meeting of our Board

that the Messrs. Beardmore had carried out the instructions of Dr. Bryce. Two of our Board came to Acton to consult with the Acton Board of Health, but as we had no quorum we could not take any action, although we were satisfied with the filtering beds at that time, but were afraid that they would not act well in the winter. We did not examine them in the winter.

Dr. KITCHEN: Are you still satisfied with the filtering beds this summer?

WITNESS: I have no objections to them. I cannot see anything to find fault with. I am as well satisfied with them as I was in December.

MARTIN FLYNN, sworn: I am a farmer, and live on lot 25, 3rd concession of Esquesing. I live on the next lot to Mr. McPherson. This stream does not run where I lived before I came here. I have lost three head of cattle, one sheep and two pigs. I lost them a year ago. The first one I knew nothing about until the morning, when I got up and found her dead. Mr. Mackenzie made cultures from the first and second cows.

Dr. KITCHEN: Where do your cattle pasture? Near the gulley?

WITNESS: I am up this way from the stream.

Dr. KITCHEN: Did any of these cattle die or were they buried near where your cattle were?

WITNESS; One of them was buried about 100 feet from where my cattle were running. I did not think my cattle got into the flats that spring, nor were they driven through the flats. I did not lose any cattle the year before. My horses had communication with Col. Allan's flats, but they did not take the disease. I had no suspicions whatever of how the cattle died, but I heard it was anthrax. I did not form any opinion regarding the cause of disease, except that they may have smelt it off Mr. McPherson's. My farm is fenced into fields. All my cattle were pastured in one field. The second cow died about a week after the first one. The third one was sick about two days. It was pasturing in the same field, but we sent her away from the others. She died there, and we buried her where she died. We put a load of lime in with her when we buried her. We put her in about seven or eight feet. We skinned the first one and opened her, but did not skin any of the others. There is no possibility of the water getting into our fields when it overflows. The pasture was very bare last summer, and the animals were grazing close. The pigs got out where the first cow was buried, and they died a few days after. The pigs were also given milk from the cow that died. We gave the milk to them once or twice. I have not heard of any other cases during the past seven or eight years. I have heard of some cases dying suddenly, but I did not know of any dying from anthrax. I lived about sixteen miles from Guelph, before I came here. I had these cattle that died, about ten or eleven years. I raised all but two of them.

THOMAS STATHEM, sworn: I am a baker, and live in Acton. I have lived here six years. I lived in Georgetown before I came here. I did not know of this creek when in Georgetown. I had a cow pastured on the flats on Mr. Allan's place last year. She got sick and died. The boy drove her out in the morning, and she came home in the evening, but did not give much milk. My wife kept her in that night. The boy took her out again next morning, but came and told us that she was sick, and could not eat. I got her home, and brought the veterinary to her, but she died. We sent her entrails away for examination. I have often been down to the creek in spring and summer. In the summer time, the flats have been overflowed. The pasture was short last year when the cow died.

W. H. STOREY, sworn: I am owner of a glove factory, and have a small tannery in order to supply myself with leather. My tannery is not on this creek. However, the stream that runs through our tannery finds an outlet into the pond, and from this I suppose, goes out in the stream. Our waste does not go into the pond. In fact we have no waste, except what goes out in the shape of dye liquors, and we do not think there is anything deleterious in it. We dress buckskins and kid skins principally. We import East

India elk skins for manufacturing moccasin stock. These hides are dry when we receive them, and we put them through the ordinary process of turning them into buckskin. They are put into water first and soaked; and when these are soaked sufficiently they are "broke" on a beam. Then we unhair them, and the skins are put on a fence until they are dry like parchment. We next put them into fat liquor, made of oil and certain alkalis, and take them in two or three times, and break up into the fulling stocks, so as to soften them. All buckskins are made in fulling stocks. We do not tan by sweating. Our skins are imported by way of New York, but they are East India skins. Our other skins are raw skins, the product of this country or the United States. We have never had any cases of disease among our work people from handling skins.

Mr. Boyd: Do you know of any cases of cattle dying here years ago?

Witness: Yes. I understand that cattle died in the same vicinity 35 years ago. Mr. Lawson's cattle died. I remember that an action was brought against Messrs. Sessions, Tobey & Co., who owned a tannery now owned by the Messrs. Beardmore. The plaintiff was Mr. Graham Lawson. It was then alleged that the cattle were poisoned by the waste running into the water. Judgment was given for the defendants.

Mr. Mackenzie: Was anything done by way of analysing the stomachs or examining the symptoms of the animals?

Witness: There was evidence put in as to the symptoms, but none relating to the analysis. The farm is immediately below Mr. Burns' farm, lot 25.

John Lawson, V.S., sworn: I am a practising veterinary surgeon, and reside in Acton. I have been practising here for ten years. The farm referred to by the previous witnesses was my grandfather's farm. I am not now interested in the land along the creek. About six or seven years ago, my attention was called to the condition of some cattle. A cow belonging to Daniel Smith was found dead on the flats, but I did not hold a *post mortem*. I had, however, examined one before that. The condition of the spleen of this animal was very much enlarged, and when lifted up the blood ran from end to end of it. The lymph glands were infiltrated; hæmorrhagic with spots. That was six years ago. The cows, then lost, were grazing on the flats, and could get as high as Col. Allan's place. There has been at least one case every year; and four years ago there were three or four. Last year there were about a dozen. I examined three last summer. The result was very similar to the one I have already described, although in some cases the symptoms were not so well marked as in others. In each of these three cases I sent portions of the animals to the Provincial Board of Health, Toronto, and in every case anthrax was found. I have heard my relatives speak of these cases many years ago, and the impression I have received is that they were similar to the present. My father told me, that his father lost seventeen or eighteen head of cattle in one season. They appeared to be all right in the morning, but in the evening they were dead. He said that his father entered a suit against the tannery men, but was defeated. It cost him $500.

Mr. Mackenzie: How many miles down the stream was the estate of Mr. G. Lawson, where these cases occurred thirty-three years ago?

Witness: About two miles at the outside.

Dr. Kitchen: What is the common origin of anthrax, in your experience and reading?

Witness: Contagion. I would not care to express an opinion in this case. It has been proved beyond a doubt that it is contagion, and that these cattle died from anthrax.

Mr. Boyd: Did you ever hear your grandfather speak as to what was done with the animals that died?

Witness: I did not. But at present I always advise owners to bury any animals that die suddenly. A number of cattle have died in this neighborhood from anthrax; some also died at Limehouse, about three miles from here.

WARREN TOBEY, sworn: I reside at Collingwood, where I am engaged in the tannery business. I once lived in Acton, but left here in 1860. I lived here for four years, and owned one of the tanneries now owned by Messrs. Beardmore—the one nearest the town. I had a suit with Mr. Lawson some time ago as regards cattle dying. He claimed that I poisoned the cattle, by the waste from the tannery getting into the water in the creek. It was not proven that they were poisoned by anything I put in the water. It was said that they were poisoned by eating poisoned weeds on the farm. I do not remember, however, whether there was any evidence to that effect. I was sued for twenty head of cattle valued at $400. It was claimed that I had killed them, and I said that they would have to prove it. It was claimed that they all died that spring. I never heard of any similar cases occurring.

Dr. KITCHEN: Did you import any hides when you were here?

WITNESS: I imported some from South America. Nearly all I used were South American hides. We used a few local hides. Our plan was to "sweat" the hides, and the refuse was run into the stream. The sweating method then used is just the same as that now practised. Very little lime is used; that is another process. I do not know anything of anthrax from actual experience with cattle. None of my workmen were ever injured from handling hides. I do not know of any other cattle dying, except the ones for which I was sued. I do not think it is a rule for cattle to die near tanneries on account of the tanneries.

ADAM LANG, sworn: I am an insurance agent, and live in Action. I had a cow that died suddenly last summer. It had been pasturing on the flats. We observed that the animal was sort of dull and was hanging around on the flats. We brought her home in the evening, and she died before morning. I had not a veterinary in to see the cow, and I do not know the cause of death. I buried her in the gulley where Flynn's cattle were buried. I did not put any lime in. It was put in about three feet deep; she was just covered up. After she died she bloated up very large. We did not open her until we got to the place where we were going to bury her, and I think a portion of the liver was taken to be sent to Toronto. I think the veterinary took some of the stomach or liver afterwards, but whether or not it was sent, I cannot say. We drew the cow down with a span of horses. We dragged her on the ground without a stone boat.

GEORGE WILDS, sworn: I am a tanner. I live in Acton, and have been a resident for over thirty years. I have been a tanner for four years. I have fished in the creek, and I caught nineteen speckled trout, and J. C. Speight caught sixteen. That was on the 16th of July. I have not known of any workman in the tannery getting a disease from handling hides.

WALTER BEARDMORE, sworn: I live in Toronto, but I am frequently in Acton. I lived in Acton for nearly a couple of years. I used to come every summer here for several summers. I have heard the evidence of the gentlemen representing the local board of health as regards the filtering basins, and believe it to be correct. We went to Dr. Bryce, and he gave us instructions and drawings, and we tried to carry out his instructions as best we knew. The basins are about 22 feet by 200. They were excavated several feet and filled in. My brother can give more definite evidence in this respect.

Dr. MACDONALD: You know there are regulations against polluting streams and creating nuisances in a neighborhood?

WITNESS: Yes; I know some of them. I know that it is not allowable to throw sawdust into streams. But we are not considered a nuisance, as we were offered exemption from taxation to come back again after the place had been closed for some years.

Mr. MACKENZIE: How long have you been importing foreign hides?

WITNESS: We have carried on the importation of South American hides for years. (The witness then, in a very full and interesting manner, described the process of tanning.)

When the dry hides are soaked in water, the water goes down into the drains and into the filtering beds. All the discharges run into the filter now. If we have to clean the filtering beds, it will be difficult to prevent some of this water getting away. The scrapings from the hides, hair, etc., are sold where possible, or else thrown out. Some of the farmers take away the fleshings and exchange straw for it. I have not known of any farmers taking these fleshings being sick. At Bracebridge the farmers take the fleshings and compete for the use of them. None of their animals have ever suffered. Cattle have died around these flats, but I have never known of the same thing occurring under similar conditions elsewhere. The refuse, from the hides at Bracebridge, goes on the fields but no evil has resulted from the practice. In addition to those already named Mr. Atcheson also had trouble with his cattle dying.

Alfred O. Beardmore, sworn: I have lived in Acton six years and am connected with the tannery. We went over the ground with Dr. Bryce, and he pointed out what he wanted and sent drawings. We excavated it near the dead trees, and laid two rows of tiles on each bed. We first laid boards, and carted the gravel down the hill, and covered it altogether with gravel. The gravel varies from a foot to two feet thick. It must be about two feet in the lower part near the outlet. We threw up the earth as much as possible; for in throwing the gravel up it does not hold solid. We put on a little gravel. It was the end of the summer before we got it finished. This spring we took up the beds and cleaned out the pipes. The tiles were quite filled up. There was some kind of black stuff in it. The earth had percolated through the joints. I have no personal knowledge of outbreaks of anthrax in this vicinity. The first summer I was here Col. Allan told me about the cattle dying a short time before. We were always sure that we put nothing in the way of poison into the stream. A Mr. Elliott takes away the fleshings. His cattle have not suffered. All the flesh scraped off, the lime and the ashes are all taken away for manure. I have not heard of anthrax occurring in the districts from whence we import our leather. All our washings go into the stream.

Mr. McPherson added the following to his former testimony: I took several loads of manure from the tannery about seven or eight years ago, and put it on the high hills for manure for the potatoes. The people would not come to the threshing and eat of these potatoes. It was not used as pasture ground, and was not where Mr. Flynn's cow died. Mr. Elliott lost a cow last fall, but he did not say much about it.

The enquiry then closed.

Report of E. E. Kitchen, M.D., Member of Committee.

To the Members of the Provincial Board of Health:

Gentlemen,—As a member of your Committee appointed to visit Acton, and examine into the cause of animals dying along the Acton Creek, in the Township of Esquesing, County of Halton, I beg leave to report that we visited these places on Friday, 22nd of July. We were met at the Acton station by Reeve Dr. Webster, Medical Health Officer Dr. Uran, and other members of the Local Board of Health of the Municipalities of Esquesing and Acton, together with the Messrs. Beardmore Bros., and a number of interested farmers. We first visited the flats and creek, the filter beds and tanneries. We then opened an examination at the town hall, where every facility was given to those who could give any information bearing upon the subject. The examination was conducted under oath, Mr. Boyd, barrister, watching and examining witnesses when he thought necessary for the Messrs. Beardmore.

The following information was gleaned, and which we herewith record for the satisfaction of the Board:—

1. That the waste of Storey's small tannery (chiefly dyes) and the Beardmore Bros. two large tanneries are poured into Acton Creek.

2. That no South American or foreign skins are tanned in the Storey tannery except East India elks.

3. That the one tannery of Beardmores' is devoted to home skins for harness purposes, while the other is used in tanning South American steer hides for sole leather.

4. That the sweating process of tanning is used chiefly in all these tanneries.

5. That the Beardmore tanneries have been in operation nearly forty years, the present proprietors owning one for three years, and the other for twenty-five years.

6. That the waste formerly contained so much color that the banks, stones, etc., in the stream are of a dark color, causing an apparent decoloration of the water.

7. That South American hides were used in these tanneries thirty-five years ago, and tanned, nearly entirely, by the sweating process as now.

8. That cattle have died suddenly that have pastured on the flats for the past thirty-five years.

9. That over thirty years ago Mr. Tobey, the owner of one of the tanneries, was sued by one Graham Lawson for $400.00, for the death of twenty cattle, thought to be poisoned from waste poured into the stream, and that verdict was given in favor of defendant. (The water was not analysed at this time.)

10. That in the springtime the banks are overflowed on flats as far as ten to twelve feet.

11. That during the summer of 1891 there were eleven cattle, two horses, four sheep and two pigs that died suddenly.

12. That all these cattle pastured on the flats, except those of M. Flynn, which ran on the heights above.

13. That, but few animals were buried six feet deep, or more, or with lime. One was cremated, a few only covered with earth, while the remainder were left exposed after death and unburied. That some of those buried were dragged over the ground by horses to their place of burial. That the greater number were left on the flats, and but a very few buried on the high ground.

14. That all portions of dead cattle which have been examined have been found to contain the anthrax bacilli.

15. That during 1891, three filtering beds, each twenty-two feet by two hundred feet, were built below the lowest tannery, under the advice of Dr. Bryce, through which waste now passes before reaching the stream.

16. That the water now passing down the stream is nearly colorless.

17. That all cases have happened between Acton and Stewarton, a distance of three miles.

18. That speckled trout have been caught in the stream during the past summer.

19. That cattle readily drink this water from the stream.

20. There could be found no case among the workmen affected, nor could any trace be gotten of any workman having been affected in past years.

21. There are no animals pasturing on the flats this season.

22. The shorter the pasturage, the greater are the number of infected cattle.

23. That all the waste does not pass through the present filter beds.

24. That the accumulation of refuse piled between the tanneries is something enormous, and has been accumulating for years.

We have no doubt, but the disease from which these animals have died, is anthrax, and has originated from the introduction of steer hides from South America. These hides being tanned by the sweating method, the bacilli are not destroyed, but pass, with the waste product into the creek, and by the overflow of its banks, are left on the soil.

When pasturage is short, like during last summer, the evil shows itself more than when pasture is plentiful and long.

We would, therefore, recommend that the present filtering basins be placed in first-class condition, by a cleansing out of the tiles and bed, and placing therein pure gravel, instead of the gravel and soil now therein—the tile should have a greater grade than now. This should be done under the direction of some competent person, who would visit daily while the work is being carried on. All the waste should be brought to the beds. These beds, when empty, need to be stirred up.

We would strongly recommend the burning of all waste material, and steps should immediately be taken that all the enormous quantities of refuse which have been accumulating for years about the tanneries be burned this season. We are confident that by care and cleanliness and good filtering basins no trouble need arise from further contamination.

For the destruction of the anthrax bacilli, which is already in the soil, we would recommend that the soil be frequently turned by plow and spade. As the parts overflowed are by no means extensive, this is not so great an expense as would appear at first sight. All doubtful lands should be fenced so that cattle, etc., cannot graze thereon. Wherever it is known that an animal is buried too shallow, and without lime, the grave should be re-opened, and, at least, lime added, if it is not feasible for a deeper burial. All places where an animal has lain exposed without burial, should be cleaned up and buried at good depth with lime, say from six to eight feet.

We cannot close this report without expressing our obligations to the Messrs. Beardmore, Mr. Storey, the farmers and citizens generally for their active assistance in getting all the facts available in this matter.

E. E. KITCHEN.

Report by J. D. Macdonald, Esq., M.D., Hamilton.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—On Friday, the 22nd July, pursuant to advice from Dr. Bryce, Secretary of the Provincial Board of Health, I, with other members of the Committee, proceeded to Acton for the purpose of instituting an enquiry relative to the appearance of anthrax, from which cattle and other animals were said to have died, in the neighborhood of that village. The committee of the Board appointed to take charge of this matter consisted of the Secretary, and Dr. Kitchen, but the former being called away on other business of the Board Dr. Macdonald was called on to take his place at Acton. The enquiry was conducted by Dr. Kitchen, the member appointed by the Board. Witnesses were called and testimony taken under oath. One of the parties interested was represented by Mr. Boyd, his legal adviser. Your committee first made an examination of the region called the "flats," and of a stream which has its course through it, tracing the stream and traversing the "flats" up to the point where is situated a tannery belonging to the Messrs. Beardmore, called the "lower tannery," of which tannery complaints have been made as having been the source of the anthrax which lately has been proving destructive to farm stock in that neighborhood, and thereby causing great depreciation of property. At this tannery your committee examined certain filtering beds constructed by the owners of the tanneries, into which beds are run all the liquors constituting the waste after the completion of the process of tanning. These beds have been made in conformity with directions given by the Secretary of this Board, and seem sufficient for the interception of the anthrax bacillus, or at least will be so, as soon as the gravel of which their banks are composed is a little more compacted.

It seems apparent from the evidence obtained by your committee that anthrax has existed in the locality examined for many years, many witnesses testifying to the fatality

of a disease having all the indications of the recent disease complained of, from a very early date, say between thirty and forty years. The evidence of Warren Tobey, who operated this tannery more than thirty years ago, strongly points to the presence of anthrax at the time of his occupation of the place. This party was then sued for the value of twenty head of cattle, of which the destruction seems to have been caused by anthrax. The suit was not successful, the claim being that the animals were poisoned by drinking the water rendered impure by his tannery; and no poison being found in the stomachs to prove the allegations.

The evidence of Col. Allan, too, is in favor of the existence of anthrax twenty-five or twenty-six years ago, he himself having lost a cow at that time, the symptoms affecting which, as related by him, seem to afford unquestionable proof of anthrax. He also testified to the loss of several animals by other people with like symptoms within five or six years past. Col. Allan's first loss occurred before the lower tannery was in operation, another tannery higher up the stream, and now called the "upper tannery," having been only then wrought.

From the evidence of Martin Flynn it appears that anthrax has occurred in animals which have not had access to the "flats," but which grazed about 100 feet from where carcasses had been buried. His cattle were in fenced fields. His pasture was bare and the animals cropped close.

Archibald McPherson, who lost many animals after he sent them to graze on the "flats," testifies to the inattention formerly given to the disposal of the animals which died. Those which died latterly he buried, but of one he says, "one which died on the flats I left there. I did not bury it, I think it is there yet." And again, "We never think of burying an animal here."

From all the testimony obtained by your committee, it would appear that these "flats" have been sown and resown with anthrax for many years, and that, though the disease there is probably originally to be traced to the establishment of tanneries on the stream running through the flat land, yet its continuance seems, in no small degree, due to the careless disposition of the carcasses of animals which have perished.

There is little doubt on my part that the lawsuit of thirty years ago, of Lawson against Tobey ended as it did, not because there was no anthrax in the case, but because there was no means of proving its existence in that locality at that time.

Hamilton, August 4th, 1892.

Respectfully submitted,

J. D. MACDONALD.

Report by P. H. Bryce, M.D., Secretary.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—As a member of the special committee, appointed to examine into the Acton anthrax outbreak, while concurring in the conclusions arrived at by the other members, I would add that the question as to how far any depreciation of the value of lands below the tanneries exists, owing to the existence of anthrax spores on the pasture lands, would seem to be a question, which does not fall within the province of this Board; but on the other hand, it would appear only just that the owners of the tanneries should give an undertaking that further danger of infection will be removed by the adoption of measures approved of by the Board.

Should this not be strictly carried out, then there would seem to be no alternative for the Board but to advise that proceedings looking to an injunction be undertaken, to prevent the waste waters from the tanneries from being poured into the creek.

All of which is respectfully submitted.

P. H. BRYCE.

III. REPORT *RE* SMALL-POX IN BRITISH COLUMBIA IN 1892.

By the Secretary.

To the Chairman and Members of the Provincial Board of Health :

Gentlemen,—The outbreak of small-pox in British Columbia, which, within six weeks, has developed such proportions as to have caused 45 cases in Victoria, 6 in Vancouver, and which has spread to New Westminster, and to Seattle in the United States, has created so serious an alarm as to result in the establishment of a quarantine against Victoria by Vancouver, by New Westminster, and the various other ports on the Sound. The outbreak illustrates two facts: first, the imperfect condition of the municipal authorities at least of Victoria, to deal with outbreaks of pestilential diseases, and second, the fact of the practical absence, on the western, seaboard, of quarantine facilities, the establishment of which lies with the Federal authorities.

It will be remembered by many, that, at the time of the visitation of small-pox in Montreal in 1885, serious dissatisfaction was expressed at the imperfect character of the quarantine on the Atlantic seaboard, and especially of that on the St. Lawrence. This dissatisfaction was accentuated with the introduction, within two months of the opening of navigation in 1886, of small pox, by way of the St. Lawrence, causing in one instance outbreaks in Ontario, Manitoba, Michigan and Illinois. Owing to representations made to the Ottawa authorities from several quarters, new quarantine regulations were passed by an Order-in-Council dated August 7th, 1886, which went into force in 1887. Since that time the Superintendent of Quarantine at Grosse Isle had been successful in preventing any cases of small-pox crossing westward, until the summer of 1891, when in the published Departmental Report for the year, the chief superintendent says, "This very season the Provincial Board of Health of Quebec has traced an outbreak of 140 cases of small-pox, scattered over that Province from Gaspe Peninsula to Sherbrooke, originating from a single case in the city of Quebec ; and in the report on that initial case the very grave and significant statement is made, "that it is considered quite possible that this case resulted from the steamship 'Brazilian,' which was at the quarantine station in June with small-pox."

As explanatory of this possibility, the report refers to "our quarantine deficiencies," and states, "for the handling of ordinary isolated cases of disease, on incoming vessels, the quarantine station at Grosse Isle is fairly equipped." "But where a vessel is affected as a whole, the station remains, notwithstanding all my unwearied efforts, as destitute of the universally recognized methods of disinfection and maritime sanitation, as it was sixty years ago. Nay, in at least one respect it is worse off now than formerly. For its small wharf was built years ago, expressly to enable the small class of sailing vessels that then brought emigrants to lie at it. The change to large steamships, as passenger carriers, has rendered this wharf useless, as no modern vessel can come to it."

The report further states: "It (the St. Lawrence station) has no means for the steam disinfection of clothing and effects. It has no appliances for drenching with mercuric chloride solution the infected vessel. It had sulphur furnaces on a fumigating steamer ; but that steamer had to be condemned, and has not yet been replaced. She was, therefore, not launched last spring, but has spent the year on the slip at Levis." Again the report states, "The vaccination regulations were altered in this year's Quarantine Proclamation, by the abandonment of re-vaccination after seven years."

I have introduced these several quotations, both to draw the attention of the public to what Dr. Montizambert, the Superintendent, with twenty-five years' experience, believes to be a dangerous state of affairs, as affecting the public health, and to indicate what is even more urgently required on the Pacific seaboard. Ever since Oriental trade and immigration to the United States began, San Francisco and thence other places have repeatedly been visited with serious epidemics introduced from Asia ; and now, with the establishment of a Canadian trade, the same dangers exist, as the present unfortunate outbreak too well illustrates.

The attention of the Department of Agriculture has more than once been called to this danger; but nothing has been done, beyond what already existed in the nominal station at Esquimault. That the danger is ignored, and the situation misrepresented may, I believe, be fairly deduced from the statement of the Minister, in answer to an enquiry in Parliament, regarding a case of small-pox, on one of the Canadian Pacific railway steamers to the effect, that the vessel was in quarantine at Esquimault, when as a matter of fact, she was, at that instant, and had been for several days, in port at Vancouver, having previously landed her case of small-pox at Esquimault.

The danger to the Pacific Province from the importation of such diseases is, indeed, greater than along the St. Lawrence, as the spread of the outbreak to so many points within six weeks, clearly shows.

Whether the disease has already gone eastward or not, a few days will show, but that it may, so long as the disease exists in British Columbia, experience elsewhere has too frequently shown. The activity of the Vancouver authorities has greatly limited the danger from that city, while the prompt action of the Canadian Pacific railroad authorities, in aiding health officers in the past, gives us much reason to hope that the imported cases will be few; but, with Victoria hotels closed, there has doubtless been an exodus eastward of commercial men, and provincial and municipal authorities to the east of the mountains will, for several months, require to be on the alert, and in constant readiness to deal with any outbreak which may occur.

IV. REPORT, *RE* POLLUTION OF DETROIT RIVER ABOVE AMHERSTBURG, WITH DETROIT GARBAGE.

By the Secretary.

To the Chairman and Members of the Provincial Board of Health:

Gentlemen,—On receipt of a telegram from Amherstburg, I proceeded there on the 21st of July, when on the following day the owners of a scow were indicted for polluting the river by depositing garbage therein.

The prosecution was made under sect. 63 and sect. 4 Schedule A, Cap. 205, R.S.O., and after full evidence was taken the court convicted the owner of the boat, the captain and crew, and levied the full penalty.

The detailed evidence is herewith appended.

The following is a copy of the information and a summary of the evidence:

A.

R. S. C., Chap. 17, Sec 13.

Canada, Province of Ontario, County of Essex. } The information of Louis Lemay, of the Town of Amherstburg, in the said County of Essex, Constable and Health Inspector, taken upon oath before me, the undersigned Police Magistrate for Amherstburg, in the said Town of Amherstburg, in the said County, this 20th day of July, in the year 1892, who says that he has just cause to suspect and believe, and does suspect and believe that Captain Neil McDonald, on board steamer Labelle, George Gabourg, Peter Bovan, James Walker, Wm. Cobb, Geo. Giblan, Jas. D. Kennan, James Payne, of the Township of Anderdon, in the said County of Essex, within the space of one month last past to wit, on the 18th day of July, 1892, at the Town of Amherstburg, in the County aforesaid, did unlawfully deposit in the river at or near said Town, a lot of garbage, filth, and animal and vegetable matter, the said deposit being dangerous to the health of the inhabitants of said Town of Amherstburg, in contravention of the Public Health Act of Ontario and by-laws governing the Public Health, contrary to the form of the Statute in such case made and provided.

LOUIS LEMAY.

Taken and sworn before me the day and year and at the place above mentioned.

S. McGEE,
P. M.

N.

DEPOSITIONS OF WITNESSES.

R. S. C., Cap. 174, Sec. 69.

Canada, Province of Ontario, County of Essex, To Wit: } The examination of Neil McDonald—James Payne, of Detroit, and John A. Auld, Stephen Pettypiece, of Amherstburg, taken on oath this 22nd day of July, in the year 1892, at Amherstburg, in the County of Essex aforesaid, before the undersigned S. McGee, Police Magistrate for Amherstburg for and in the said County, in the presence and hearing of Neil McDonald, James Payne, Peter Bovan, Jas. Walker and Jas. Kennan, who is charged this day before S. McGee for the said defendants above named, at Amherstburg, on the 18th day of July, 1892, did unlawfully deposit in the river, at or near said town, a lot of garbage, filth and animal and vegetable matter, the said deposit being dangerous to the health of the inhabitants of said Town of Amherstburg, in contravention of Public Health Act of Ontario, and by-laws governing the Public Health, and contrary to the form of the Statute in such case made and provided.

(Signed) LOUIS LEMAY.

This Deponent Capt. Neil McDonald, upon his oath, says as follows: Am captain of steam barge Labelle; haul garbage from Detroit City to the river; on Monday night, 18th, brought a cargo of garbage down the Canadian Channel to the foot of Fighting Island, where we commenced unloading into the river, and distributed all along the river from the foot of Fighting Island to the lake shore, and above Bois Blanc island, quit just at head of Bois Blanc Island and went out to lake distributing on the way out below the town. My crew are George Gabourg, deck hand, and Giblan, engineer; the four men who dump the garbage, James Payne, foreman, James Kennan, James Walker, Peter Bovan, three dumpers; William Cobb was not on board on 18th; Payne, Kennan, Walker and Bovan dumped the garbage; Gabourg washes the boat off in the mornings and cares for lights; the engineer, Giblan, fires and runs the engine. The garbage is unloaded under my direction. I tell them where to dump and where to stop; the garbage is a lot of filth.

To Mr. COWAN.—Am pilot or captain of the craft; I never deposited any of it in the river; I only control the engineer and deck hands; the dumpers are under my charge; I decide where and when to dump it off; the men are under my control; Payne has contract to put it off and hire the other men. I dumped on Stoney Island side of channel and headed towards Bois Blanc Island east, and above Island and dame down between Amherstburg and Bois Blanc; dumped at Limekiln crossing on way down before reaching Bois Blanc. Gabourg sometimes shoveled but not that night.

Re-examined.

Did not dump from head of Bois Blanc Island to foot of it.

(Signed) N. McDONALD,

V. REPORT OF SECRETARY ON THE CONDITION OF A PUBLIC SCHOOL BUILDING IN WELLAND TOWN.

To the Trustees of Public Schools, Town of Welland:

GENTLEMEN,—Having learned of an outbreak of cerebro-spinal disease in a number of children attending one of your schools, I took an early opportunity of visiting the town.

In the company of Mr. Gross, the Chairman, and Mr. McCaw, I visited the school complained of and inspected it, and its surroundings.

Regarding the school building, I would say that an examination of the ground under the building, shows no excess of moisture. Indeed the joists, when examined, were perfectly sound and free from fungoid growth, always present with excess of dampness.

The foundation walls are of stone, rising one and a half feet above the ground, with a number of fresh air inlets. The walls are dry.

The floors are in some rooms fair, in others bad, and the filth, that accumulates in the large cracks when the floors are tramped upon, rises up in dust, and creates irritable throats and spreads germs of disease if present.

The ventilation of the building is extremely defective, there being none, except what is possible by windows. These, though high, are narrow, and cannot be lowered in winter time, there being no double windows. Wood stoves in some rooms, at one side of the room, must make the heat excessive near them, if the farther part of the room is to be kept warm.

With these heating and ventilating defects is associated overcrowding to an excessive degree. In one room 150 cubic feet, and in none much more than 200 per pupil, are possible, with the numbers ordinarily in attendance. Three hundred may be considered a minimum allowance, when first-class heating and artificial ventilation are present; but the above amounts for young, susceptible children are unpardonable.

As regards surroundings, the grounds are too small for 300 children, while the outbuildings and stables on the rear of lots to the right of the school building are within 25 feet of the building, and consisting as they do, of three or more privies, with several stables and cattle byres, are at the best undesirable neighbors, but being in a filthy state, are positively detrimental to health.

The Board of Health must insist on boxes in the privies, the use of sawdust and regular removal of contents, and the maintaining of stables in such a way, that manure heaps be kept under cover, and not more than one load kept on premises, and that stables have water-tight floors.

As regards permanent remedies for the school, I would say that it is urgent that a better site, and one having large grounds, be selected, where plenty of fresh air and healthy surroundings are possible, and that a building completely cellared, cemented below and drained, be constructed, and that some modern and effective system of heating and ventilation be introduced; overcrowding will thus be avoided, and the air of the building can be maintained in a pure condition.

In case this be not carried out this season, I would advise that the present building have a furnace room placed under it, the whole ground beneath the building grouted with cement, and a good furnace built in for heating the whole building, from which properly constructed air shafts can be led to a chimney, and the air of the rooms be maintained in a good state. Some of the old floors should be cleaned and covered with a second floor.

Yours, etc.,

P. H. BRYCE.

Toronto, 5th April, 1892.

VI. SUGGESTIONS MADE TO TOWN COUNCIL OF LINDSAY *RE* PROPOSED PUBLIC WATER SUPPLY.

Gentlemen,—Having been requested to examine the proposed location and source of the water-works for your town, to be constructed by Messrs. Moffatt, Hodgkins & Clark, of Waterton, I visited Lindsay on 25th inst., and having examined into various matters, would report as follows:

1. That, owing to the contract, so far as complete, having been signed before the plans, source, analysis, etc., were submitted to the Provincial Board, as required by section 30, cap. 205, R. S. O., 1887, it will be well to closely enquire as to how far the contract then signed is legal, and as to whether the contract at present existing, or modified, should be re-signed, the plans having been on the 17th inst. submitted to the Board.

2. That, as the contract deals only with Scugog water, and as various analyses have pointed out a great excess of vegetable matter in solution, the question of the water being made by filters a good water is of prime importance, if that part of the contract referring to water for domestic use is to be of any value.

3. From my observation and experience, I strongly recommend some one of the filters —Hyatt or National—now in the market, or some other arrangement equally good as filters, such as sufficient beds of sand and gravel (to be used in alternate sets so that they may cleanse by rest).

4. The location on the river at Mary street seems to be equally good with any other for taking the water from the stream, as it will be the same water there as a mile up, if new sources of pollution are prevented from contaminating the water above.

5. A pump-house, etc., can with convenience be erected at Mary street.

6 From a knowledge of the strata north of the Oak ridges at different points, and from the general presence of artesian wells wherever borings have been made in Lindsay, I deem it proper to say that I believe borings sunk 75 to 100 feet near the Mary street location will give a good artesian head of ten or twelve feet, while a number of these, if successful, coupled together, would materially assist in giving a pure supply, providing analysis shows the water to be free from disagreeable constituents, which, I am glad to say, is the case with the sample analysed.

As the experiment can be made at the nominal cost of $100 or so, I would strongly recommend the council to expend money in a proper experiment, both to give better water to the town if possible, and, if not successful, to remove reasonable grounds for complaint, since it would show that the Scugog is the only available supply.

Hoping that these observations may be of use both to the town and to the company.

I have the honor to remain,

Your obedient servant,

P. H. BRYCE,
Secretary, Provincial Board of Health.

To the Mayor and Members of the Town Council,
Lindsay, Ont.

VII. REPORT *RE* PETERBOROUGH SEWERAGE SCHEME.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Committee on Water Supplies and Sewerage Systems beg leave to report that they have had laid before them the plans of a system of sewerage for the Town of Peterborough, prepared by Mr. A. Macdougall, C.E.

After a careful consideration of the plans, with explanations by Mr. Macdougall, your Committee, learning therefrom that the proposition for the present was to discharge the sewage into the Otonabee below the town, thought it well to notify the Local Boards of the townships along the river below, and give them an opportunity for expression of opinion as regards any evil effects upon their property and the lives of their ratepayers.

Communications were received from some of these Boards protesting against the scheme ; so your committee, in order that it might be made better acquainted with the facts, arranged with the several Boards interested to hold a joint meeting at Peterborough on April 16th.

Your committee reached Peterborough on the evening of the 15th, and then met members of the Local Board of Health, the Town Council and members of the Board of Trade. Their various views on the matter were heard, and some of the pressing sanitary needs of the town detailed. On the succeeding morning your committee, with members of the various above bodies, went down the river in a steamer and examined its course and the character of the banks. It is the largest river in the Province, excepting the Ottawa, and discharges many gallons per minute over the dams.

Its waters are kept comparatively even in flow throughout the season owing to their being stored throughout the spring in the numerous lake basins on the river above and its tributaries. At the time of our visit the river was some three feet below flood height, and has not a large amount of drowned land during the upper part of its course below Peterborough. The farms run down to the water's edge, and the houses and barns

are situated on the high ground, usually several hundred yards from the banks of the stream. The river is deep enough for steamboats to run down to Rice lake throughout the summer.

The shores in the neighborhood of the outfall are of a light soil and porous character. There is on the line of the proposed outfall a large, level tract especially well suited to the purposes of a sewage farm, whenever this is demanded.

The town is growing, and has several business streets closely built up; and while the extension of the public water supply has prevented many evils incident to soil pollution, there is urgent need, both in the interests of health and progress of the town, to establish a sewerage system. This is seen in the public nuisance at present existing along the course of the creek flowing through the town, and which is made an open sewer for a large number of private drains from houses, hotels, etc., and especially at one point where the sewage from the large Edison works is conducted to it by a large open box-drain situated under the sidewalk.

After an inspection of the river and town, your committee met with representatives of the various interests, and the chairman, Dr. Macdonald, after stating the objects of the committee, called upon various gentlemen.

The following is a *resumé* of the discussion which took place:

MINUTES OF THE MEETING HELD IN THE TOWN HALL OF PETERBOROUGH, APRIL 16TH, 1892.

The Board's Committee on Sewerage and Water Supply held a session at 3 p.m. in the Council Chamber, Peterborough, to hear evidence regarding the disposal of sewage by the proposed sewerage system of Peterborough.

Dr. Macdonald in the chair.

The CHAIRMAN presented in a few words the Board's duties under the Act, pointing out the intentions of the Act, and the Board, on visiting Peterborough, were endeavoring to obtain evidence with regard to the working of the Act. He pointed out how the river must become of necessity the final outlet for the sewage effluent, and it will be for the Board to consider what methods are best to be carried out in order that this effluent be innoxous.

ALLAN MACDOUGALL, C. E., was then called upon. He said: "The principal consideration was in any system, 'what was to be done with the sewage?' The laying of levels was easy enough, but to bring them together into one system was the difficulty. The question was not to consider whether the disposal was in one municipality or another—so long as the public health was concerned. After consideration, he concluded that the most satisfactory way was to pour it into the river at Lock street, because the ground was level, and this point was more convenient than at Park street. It would be more difficult and expensive going down to the latter. His view was to prepare a system for 30,000 population. This is always advisable. In course of time there will be an increase of population. What are the contents of this sewage? Kitchen waste, closets and bath-tubs, in addition, manufacturing industries. These may become a nuisance—as dyeworks, chemicals, oil refineries, etc. Human waste of itself is not difficult to deal with, probably best by passing it through land, as in England and France. Massachusetts has lately experimented largely, with conclusions that land is ample for purification. Some rivers have natural pollution unfavorable for drinking purposes. The present question is, what is the least amount of pollution? It will not be until 10,000 of the population use sewers that the pollution will be 1 in 540. This river has a good current in a favorable condition, as when we visited it to-day. The banks are sloping, well situated, few flats along the river. Any pollution poured out at the middle of the stream will not, in my opinion, be noticeable within a quarter of a mile from the outfall. The township representatives are naturally anxious regarding pollution; but there is a constant churning of the sewage, and there will be no fear of sewage lodging along the banks, nor any danger to cattle drinking from the river. I state this on my professional reputation. My opinion to the townships, if asked, would be just the same as that I have given to the committee.

Mr CAHILL, Chairman of the Sewerage Committee of Peterborough Council, assumed that the friends of the Townships would not object to Peterborough building sewers, but that they might object to its disposing of the sewage. It is a necessity for the town, and will be an advantage to those surrounding. An expense will be necessary of say $200,000. In adopting systems, 99 per cent. of towns dispose of sewage in streams—99 per cent. in streams smaller than the Otonabee. We do not expect those below to be hurt. In disposing of this subject we got the best advice possible in Mr. Macdougall. We will be glad to supply all information possible.

Mr. DENNISTOUN, of the Board of Health of Peterborough, said: "We are much interested in the proposed sewerage scheme. The town people demand we shall supply such a system—whether the vote will be favorable must be seen after—we now wish to formulate a complete plan. The Provincial Government has wisely provided that such plans be submitted to the Provincial Board, and they must investigate and approve, and they are here to-day to discuss the matter. They have the matter under control; they have power later to require us to remove any real nuisance complained of, and we trust the neighboring muni-

cipalities will not be unreasonable in the matter. One point raised by the Warden, viz , that objectionable sewage would float. It was answered that such matter is disintegrated in the long outflow pipe. The people and the Local Board are urging it on the council, and we hope the townships will help us."

Mr. BELCHER said that what has been laid before the Board rendered further remarks unnecessary on his part.

Mr. FOSTER, the Warden, said he thought that it might perhaps be an injury to the people living along the stream—he feared there would be an odor.

Mr. MACDOUGALL explained that a steel pipe will be carried into the penstock on shore and thence into the middle of the stream. He did not think there would be any danger to dairy farms.

Mr. FOSTER asked whether Mr. Macdougall would not prefer taking his milk from a man up stream rather than below the output.

WM. ANDERSON, Reeve of Otonabee, said : "Of course the sewer is a new thing to us, so we opposed it, as we thought it might cause defilement. We thought it might be offensive to people living near by ; but as Mr Macdougall has assured us that it will not affect any of us, we shall not oppose it now."

Mr. MONAGHAN, Reeve of South Monaghan, said : "We do not think it will affect us as we are so far away. Some of our ratepayers have since objected that floating matters would come in on their lands. It has been said that this matter would be taken away, but this is not always done. There might be a cause of trouble some day, but in the meantime our township does not wish to oppose the progress of the town, and will not give a factious opposition."

Mr. COLLINS, Secretary of North Monaghan Township, said he understands the present scheme is for all time, and the township wants a safeguard for the future, and referred to the alternative of a sewage farm in the place, which at that time will be built up and so will not be obtainable. There is a present Statute preventing sawdust, and yet they are being asked to allow this scheme to go on. He objects to be left helpless in the matter.

Mr. KENNEDY, of Otonabee, said he thought Peterborough required a system of sewerage, but he objects to the point of disposal, as the river is not a rapid one. The large marshes and bays to be seen in August are not seen to-day. He said at the Yankee Bonnet the current will cause an eddy, and on flats five to six inches of sawdust are deposited. We do not want sewage in addition. He is of opinion that people would object to the butter and milk from this district if other could be got. His farm is within one-half mile of the point of discharge, and has a half-mile of river front farm. The smell from sawdust at present is most disagreeable. He was sure sewage would not lessen this. Along the river are dozens of farms where flooding takes place frequently in the spring ; this year not so much so. In low water the river is very sluggish. Deposits will take place, and do take place in high water. On this account he does not want one drop in 40,000.

Mr. COLLINS made an explanation, and asked several questions.

Mr. MACDOUGALL answered the objections, and said that sawdust was deposited owing to its weight when water-soaked ; sewage being little else than water, does not deposit on the bottom in the same way. In the Eastern States the chief trouble is due to manufacturing refuse. He could not advise that Peterborough should go on creating a nuisance.

Mr. MELDRUM, Councillor of Peterborough, pointed out that at present the sewage goes into the river. He thinks the extra amount of sewage at the end of ten years will not be perceptibly more contaminated than now. He thinks the town will be prepared then, if trouble arises, to do their duty to neighboring municipalities.

Dr. BRYCE explained the law as it stands, and how redress might be obtained if any nuisance should arise in the future.

Mr. YOUNG, Councillor of Peterborough, asked of Dr. Bryce regarding experience *re* pollution.

Dr. BRYCE explained at some length the dangers of sewage pollution, and pointed out that the town may expect some day to have to complete their scheme of purification.

Mr. CAHILL took the chair.

Mr. MELDRUM, seconded by Mr. VELLY, moved a vote of thanks to the Committee for their courtesy in listening to the evidence presented.

Dr. MACDONALD responded.

Mr. DENNISTOUN moved a vote of thanks to Mr. Macdougall for preparing the plans and presenting the subject from a professional standpoint in so favorable a light.

Mr. YOUNG seconded the motion.

Mr. MACDOUGALL responded, expressing his appreciation of the kind remarks.

The meeting then adjourned.

From the discussion, it is apparent that the township representatives are keenly alive to their duty in protecting the interests of their municipalities, and that the town is equally desirous of giving due consideration to the township's interests.

After a careful consideration of the various points at issue, which are herewith summed up, your committee have arrived at certain definite conclusions.

The points to be considered are :

1. The fact that the sanitary needs of Peterborough demand at once the construction of a complete system of sewerage works for the greater part of the town, notably the thickly populated.

2. That, owing to the surface configuration, the engineer has shown that a very complete and economical system can be carried out in which practically the whole sewage of the town may be collected into one main sewer.

3. That this, as far as the town goes, may be conducted down Lock street by gravity, there pouring its sewage well below the town into the river.

4. That the route of this main sewer is such as to make it possible, by a very slight elevation of the sewage, owing to the head it gets in the town, to run it on to a level tract of land, there to be purified by intermittent downward filtration. There is no doubt but that the land can be made to pay a good portion of any cost of so treating the sewage, from the crops which can be raised on it.

5. That, inasmuch as the population of the town is at present not more than 10,000, of whom for years not more than 5,000 will have house connections with the sewers, and that as for some time the sewage will consist principally of sink and kitchen sewage, the amount of pollution, as far as bulk goes, will not create at the point of delivery into the river, or below it, any notable nuisance to persons living along its banks.

6. That, if the town increases, the pollution becomes such as to give reason of complaint, the town will then be in a position to deal more readily with any increase of expenditure incident to the disposal of the sewage in some other manner.

7. That, while it may be true that there will be no pollution serious enough to make a nuisance unpleasant to the senses, yet it cannot be forgotten that all water polluted with sewage—even in small quantities—does at times become the vehicle by which contagious diseases are conveyed. Hence, if the Otonabee were to be in the future the source of public supply for any town, it would become imperative that Peterborough dispose of its sewage by filtration or other disinfectant methods. At present, as the well water supply is everywhere abundant on the farms along the river, the river water will not be used for household purposes.

8. That, as the Board is aware, there are, however, dangers attaching to sewage where it overflows flats and deposits on them (as it has presumably done at Guelph and Acton) the spores of a contagious disease fatal to animals, viz., anthrax. In case there be woollen factories, tanneries, etc., at present or in the future in Peterborough, pouring their sewage and waste water into the river, this Board's experience, in at least these two places, places the duty upon it of informing the town of Peterborough that the sewage of these factories, etc., would have to be specially treated before leaving their premises, otherwise the town might at any time come into collision with the other municipalities, while the owners of cattle destroyed would certainly have a right to claim damages for any injury done to cattle in this manner. That this danger is not imaginary is seen in the difficulty which has arisen at Acton, and which is now the subject of a petition of enquiry before the Board.

Your committee, therefore, keeping in mind all these considerations, would say :

1st. That it approves of the plans of the system of separate sewerage prepared for the town of Peterborough by their engineer, Mr. Macdougall.

2nd. That, in view of the initial expense incident to any scheme, your committee deems it desirable that the amount of money required to be raised in the town at first be the smallest compatible with the character of good work.

3rd. That for several years the work will not be so much that of carrying sewage as of house water and cellar drainage; and hence the pollution of the river will not be large.

4th. That, while the Board approves of the placing of the outfall of the sewage in the river for the present, it does so conditionally, *i.e.*, that whenever pollution is complained of, and can be fairly shown to be productive of results prejudicial to the interests of the townships or of individuals, either in the town or townships, the town must then complete the system as outlined in the report, by arranging for a filtration of the sewage or other method satisfactory to this Board, before pouring the effluent into the river.

5th. That the town must undertake from the beginning the control of those industries—as woollen mills, tanneries, etc.—whose wastes may produce upon cattle, etc., poisonous effects, either in the water or on the lands flooded by it. This precaution seems necessary in order that the town may be free from any action for damages which might be brought by individuals losing cattle pasturing on the flats below.

On the understanding that the proposed plans, as set forth in Mr. Macdougall's report, comprise such as will enable the town of Peterborough to adequately protect existing interests in other municipalities, your committee would recommend the scheme for the approval of the Board.

(Signed) J. D. MACDONALD,
PETER H. BRYCE,
HARRY E. VAUX,
Committee.

VIII. REPORT ON THE OUTBREAK OF DIPHTHERIA AT AGRICULTURAL COLLEGE, GUELPH.

By the Secretary.

To the Honorable John Dryden,
Minister of Agriculture :

Dear Sir,—Acting under your instructions I proceeded on March 25th to investigate the outbreak of disease at the Agricultural College, Guelph. I found the following condition of affairs :

(1) That Aggie O'Connor, a servant, the first person in whom diphtheria appeared, took sick and was sent to the hospital December 15th. Prior to her taking ill it appears that two sisters, Susie and Kate James, were sick with sore throat about the beginning of December, Susie about a week before Kate, and Susie had a relapse afterwards. These were, in my opinion, the first cases from which other cases spread amongst the servants ; especially as there is evidence going to show that Aggie O'Connor was exposed to infection in the city, although from having subsequently attended a party some miles away and having come home in the night air she probably caught cold, making her susceptible to the infection.

(2) The second case was a student, O. W. Holmes, who went to the hospital February 9th. This is presumbly a case due to new infection, as nearly two months have elapsed since the O'Connor case.

(3) The three next cases were J. M. McCrae, H. Story, Lizzie O'Connor, and were probably exposed to infection originating from the same source, or directly from Holmes, as they took sick together February 17th, the usual period of incubation after exposure to a case.

(4) No further cases occurred until the return of these cases from the hospital, the next being March 12th, in the person of R. Maclean and Pansy Mills, two days later. These were probably due to infection brought back on the persons or on the clothes of the previous sick.

(5) The last were two cases, W. Robertson and W. R. Graham, on March 22nd, ten days after Maclean. This again looks suspiciously like infection from Maclean.

(6) In addition to the above cases, Forsyth, the gardener, took sick March 13th, and Macdonald, who boards near the College, on March 22nd. It will be seen that these belong respectively to the two last outbreaks ; exposure to infected persons of convalescent students was quite possible.

(7) Now, whether the cases in the successive series were due to direct infection from the persons of those previously sick or not, it is apparent that infection was present in some form in the College ; and the history of diphtheria outbreaks in our public institutions has invariably been the same, that once the infection has been introduced, it is extremely difficult to get rid of it, owing to the air of these buildings being wafted along the corridors and stairways from infected centres to almost every portion of the building. The infection becomes more positive whenever at any portion of the building foul air is present from defective plumbing. The latter seems to keep throats in an irritable and susceptible condition. That the air of the building had become unwholesome, the appearance of a case of typhoid about the middle of March seems to prove conclusively.

(8) In order that my inspection might be of practical value it was necessary that I should assure myself of the condition of the plumbing. Remembering that it was partially old (15 years in the old building) I determined that nothing less than a personal examination of all the plumbing fixtures in the building, and subsequent application of the smoke test, would be sufficient to determine this point.

The Public Works Department having no officer or appliances for doing this work, I obtained the services of Inspector Copping, of the Toronto City Health Department, who, with his appliances, applied the smoke test throughout the whole building. The details of his examination with his recommendations are contained in the attached report. Owing to an urgent telegram to investigate a suspected case of small-pox at Thamesville, I took the afternoon train, and left Mr. Copping to apply the smoke test with the aid of his assistant.

(9) The plumbing shows defective workmanship in some sections, and in other defective principles of construction. The Inspector's recommendations, based upon the results of the smoke test, are almost all urgently demanded. I would make several slight exceptions to them ; one being the absolute removal of the closet in the boiler room, it being necessarily in a dark space, and unnecessary as the students' closets are near by. Thus one possible source of danger and expense is removed. It is also desirable that the old cesspool into which some of the central building fixtures still empty be done away with, and that the drain be turned into the common sewer leading to the tank-house.

(10) With regard to the latter I have to report that some change in the management is urgently demanded. Pipes have been allowed by attendant to get clogged or frozen, and the sewage was being turned into the creek at the time of my visit. Carelessness in other details of its management was equally manifest. As this attendant is paid, I believe by the Public Works Department, the President of the College assumes no control of him, and as he is not under the daily eye of the other Department he seems to be a law to himself.

I would suggest that the efficient attendant of the closets and wash-rooms be placed in charge of the whole plumbing and sewerage system, a simple matter if he be instructed in his work.

(11) In conclusion, I beg to say that it is advisable that the work of plumbing repairs be undertaken as speedily as possible, and that in whatever way it be carried out, whether by the Public Works Department, or by a local plumber by day work, the work ought not be paid for until after inspection, and the smoke and water test have shown the work to be perfect.

I have the honor to be,

Your obedient servant,

P. H. BRYCE,

Secretary.

IX. REPORT OF CONFERENCE BETWEEN PROVINCIAL AND FEDERAL PUBLIC HEALTH AUTHORITIES *RE* CHOLERA AND VITAL STATISTICS.

A Conference of representatives from the Provincial Governments, officially called by the Minister of Agriculture, was held in the Department of Agriculture, Ottawa, on January 31st, instant, for the purpose of considering :

(*a*) The relations between Dominion and Provincial sanitation ; and

(*b*) The question of devising a method for collecting and publishing health statistics to be common to the Dominion and the Provinces.

The following representatives of Provinces were present :—Ontario : Hon. Mr. Harcourt ; Hon. Mr. Gibson ; Hon. Mr. Bronson ; Dr. Cassidy, President Provincial Board of Health ; Dr. Bryce, Secretary Provincial Board of Health. Quebec : Hon. L. P. Pelletier ; Dr. E. P. Lachapelle, President Provincial Board of Health ; Dr. E. Pelletier, Secretary Provincial Board of Health. New Brunswick : Hon. James Mitchell. Nova Scotia : no representatives present in answer to the official invitation. Manitoba : Dr. O'Donnell. Prince Edward Island : Hon. Senator Macdonald ; Mr. L. H. Davies, M.P., (Mr. John Yeo and Mr. J. McLean, M.P., were officially accredited as representatives for Prince Edward Island, but were not present). British Columbia : Dr. J. C. Davie, Provincial Health Officer, was officially accredited, but did not arrive in time to be present at the opening of the Conference.

Dr. F. Montizambert, Superintendent of St. Lawrence quarantines, at the request of the Minister of Agriculture, was present.

After the Conference had assembled, Mr. Lowe, the Deputy Minister of Agriculture, stated that he was charged by the Minister of Agriculture to say that he would be present at a later period of the Conference, he having been prevented from being present at the opening.

The Deputy Minister of Agriculture, who temporarily occupied the chair in place of the Minister, in answer to questions from several of the members, informed the Conference of the recent action of the Government in strengthening and furnishing approved appliances at the quarantine stations of the Dominion ; and also of the provisions of the regulations established under the Quarantine Act, and the action of the Department thereunder when cholera threatened last fall. He further, at request, communicated to the members the terms of the Orders-in-Council in relation to Grosse Isle, British Columbia and Halifax quarantines.

It was moved by the Hon. Mr. Gibson, and seconded by the Hon. Mr. Pelletier :

"That a committee consisting of the following named members of the Conference who are present, be appointed to prepare a report to be submitted to this Conference to-morrow morning at 10 o'clock, such report to embody, in brief form, the several duties and responsibilities to be assumed respectively by the Dominion and the Provinces in the matter of taking precautions against and dealing with any threatened invasion of Asiatic cholera :—Ontario, Dr. Cassidy and Dr. Bryce ; Quebec, Dr. Lachapelle and Dr. Pelletier ; New Brunswick, Hon. Mr. Mitchell ; Manitoba, Dr. O'Donnell ; Prince Edward Island, Senator Macdonald."

The resolution was unanimously adopted.

It was moved by Dr. Bryce, and seconded by Dr. O'Donnell :

"That the committee organize, and that Dr. Cassidy be chairman and Dr. Pelletier be secretary."—Carried

The Conference sat from 2 o'clock until 5 p.m., and then adjourned.

DEPARTMENT OF AGRICULTURE,
Ottawa, January 31st, 1893.

The sub-committee met in a room of the Department of Agriculture at 8 o'clock and continued to sit until half-past 12 p.m. The following was unanimously adopted by it :

(1) That the following maritime quarantine stations, namely : Grosse Isle, Halifax, St. John, William's Head, should be equipped with deep water wharves, steam cylinders, tanks for bi-chloride of mercury solution, sulphur dioxide blasts, suitable water supply, hospital and accommodation buildings for the detention of the various classes of passengers, and with such other requirements as pertain to first-class stations ; and that Chatham, New Brunswick, be also equipped with all the appliances necessary for a quarantine station on the Gulf coast.

(2) That in the opinion of the committee it is necessary that provision be made whereby quarantine inspection by properly trained medical officers be established at Rouse's Point, St. Alban's, Niagara Falls, Ontario, McAdam Junction, and such other ports of entry from the United States as may be decided upon as necessary, according to circumstances ; and that such ports of entry be equipped with disinfecting plant, houses of detention and such other appliances as may be necessary for efficiently protecting the country against the invasion of cholera. Further, that at Winnipeg, the entrepot of immigrants east and west, a fully equipped quarantine station be established and maintained.

(3) That in the opinion of the committee, it is urgent, in the public interest, that the supervision of the various quarantines be under the charge of an experienced quarantine officer, appointed by the Federal Government, who shall direct such quarantine measures as the emergency shall demand for the protection of the country, and who shall from time to time inspect such stations with a view to maintaining them in a state of efficiency.

(4) That in the case of vessels coming from foreign ports, they shall report for medical inspection before receiving customs entry. Should infectious diseases have occurred during the voyage, or cases of infectious disease be found on board, the medical officer appointed by the Government shall order the said vessel to report for inspection and disinfection at the nearest quarantine station.

(5) That in the opinion of the committee it is necessary for the safety of Canada that the baggage of every immigrant coming into this country during periods of foreign epidemics be disinfected by the methods already recommended by the committee ; and that such disinfection be performed at a regularly appointed station.

(6) That vessels coming from infected European ports, no cases of infectious diseases having occurred on board during the voyage, should be thoroughly disinfected at a regular quarantine station.

(7) That vessels having had cholera on board during the voyage should be disinfected and detained at quarantine during seven days from date of last case.

(8) That in the opinion of the committee it is necessary, during epidemic periods, that immigrants be followed to their destination. This can be done by the Government insisting that every shipping company shall provide each immigrant while on shipboard with a health ticket in form satisfactory to quarantine and provincial health officers, which shall be a passport of health to the point of destination, and to officers wherever inspection takes place. All municipal health officers should also be notified of any immigrants arriving within their districts by letter or telegram from the quarantine to a provincial or state health officer.

(9) The following do not apply to immigrants who are provided for elsewhere :

(*a*) When a train arrives at the railroad station and the passengers do not come from a place where disease is epidemic, they will be allowed to proceed.

(*b*) When passengers are not sick but coming from an infected place, the disinfection will be made of their soiled clothing, and they will be allowed to proceed on condition that they report to the clerk of the municipality to which they are bound. The quarantine officer will notify said clerk and also the Provincial Board of Health.

(*c*) When there are passengers sick, or apparently sick, from an infectious disease, they will be landed at the infectious disease hospital. Passengers occupying the same car will be detained for 48 hours, and the effects which they brought on the same car will be disinfected. They will then be released on condition that they report to the clerk of the municipality to which they are bound. The quarantine officer will notify said clerk and also the Provincial Board of Health.

(*d*) Passengers travelling through Canada who are only suspected of having infectious disease will be allowed to proceed to their destination, the quarantine officer notifying the Provincial or State Board of Health to which they are bound.

(*e*) The cars in which there shall have been sick persons shall be disinfected.

(*f*) Cars coming from an infected district will have to be provided with latrines containing disinfectants.

10. Should the United States Government adopt a twenty days' quarantine against cholera in 1893, the Federal Government of Canada will enforce the same rule against immigrants who may wish to travel from European ports through Canada to the United States.

(11) When cholera is epidemic abroad, the importation of rags from or collected in infected countries shall be prohibited.

(12) Cars containing merchandise which is susceptible of infection (baggage, wearing apparel, rags, hides, leather, feathers, horsehair, animals remains in general, unbaled wool etc.,) coming from an infected district shall be properly disinfected.

Moved by Dr. Bryce and seconded by Dr. O'Donnell, that the report as read be adopted.—Carried.

Department of Agriculture,
Ottawa, February 1st, 1893.

Tuesday, February 1st, 1893.

The Conference met again this day in the Department of Agriculture at 10 o'clock a.m.

The Hon. Mr. Angers, Minister of Agriculture, was present and presided.

The report of the sub-committee was read and passed by the Conference, item by item, and unanimously adopted.

A request was made by members of the Conference that copies of the Orders-in-Council which were communicated by the Deputy Minister at the Conference yesterday should be communicated to the members. The Minister of Agriculture assented.

The question of health statistics next came up for consideration, and after discussion, it was moved by Dr. Bryce and seconded by Dr. O'Donnell :

That in the opinion of this Conference it is desirable that the Federal and Provincial authorities co-operate in the work of collecting, compiling and publishing the vital statistics for the Dominion.

That the cost be divided between the Federal and the several Provincial Governments on some basis similar to the following :—

(i) That the amount paid for registration be an equal charge upon the Federal and any Provincial Government collecting the same.

(ii) That in any case the amount of indemnity paid by the Federal Government for collection of returns by any Provincial Registration Bureau, shall be made upon the basis of the relative number of registrations returned.

(iii) That for obtaining the best results it is desirable that the schedules and forms for collecting returns be as nearly uniform as possible for every province.—Carried.

The Conference sat in the evening at 8 o'clock, after adjournment, for the purpose of meeting Dr. J. G. Davie, the representative from British Columbia, who arrived by an evening train.

The resolutions which had been passed and the report of the committee were communicated to him.

It was moved by Dr. Bryce, and seconded by Dr. O'Donnell:

That in the opinion of the Conference it is urgent that the various provincial health organizations do carry out thoroughly the work of municipal inspection with regard to:

(*a*) The protection of public water supplies;

(*b*) The disposal of garbage systematically;

(*c*) The disposal of manure and lane and road refuse;

(*d*) The cleansing of polluted creeks, bays, etc., in the various municipalities along the lines of railways and elsewhere; and that these municipalities be required to supply medical officers, places of detention, and disinfecting appliances as may be necessary to take charge of any cases of cholera which might occur within provincial jurisdiction.—Carried.

It was moved by Dr. Cassidy and seconded by Dr. Pelletier:

That the Conference urge upon those Provinces having no Provincial Boards of Health or other health organization, that their Legislatures do take early action toward passing legislation to this end, both for their own protection and that of neighboring Provinces.—Carried.

It was moved by Dr. Cassidy and seconded by Dr. Pelletier:

That the report of the sub-committee be amended by adding to it the resolutions passed containing further recommendations.—Carried.

It was moved by Dr. Bryce and seconded by Dr. Cassidy:

That a copy of the report of the proceedings of the Conference be furnished to each of its members, and also to the several Provincial Governments represented.—Carried.

The Conference then dissolved.

Certified correct copy,

J. LOWE,
Deputy Minister of Agriculture.

(*Copy of letter of representative of the Province of British Columbia, containing expression of his views desired to be conveyed to members of Conference.*

OTTAWA, February 2nd, 1893.

SIR,—On the 24th January last I received a communication from the Provincial Secretary of British Columbia, Col. James Baker, requesting me to be present at a Conference to be held at Ottawa on the 31st January, the Conference to consist of representatives from the several provinces of the Dominion, to consider matters pertaining to *Maritime and Provincial Sanitation*. I accordingly left on the evening of the 25th and arrived on the evening of the 1st February, unfortunately too late to take part in the discussion which had been held. Through the kindness, however, of yourself and others I was accorded the privilege of meeting the majority of the members of that Conference, at which meeting the result of the Conference was put before me in the shape of a number of resolutions which had been adopted and recommended to the Dominion Government, on the subject of Maritime Sanitation. These resolutions relate solely, *so far as I can see*, to maritime sanitation, and with them I an in full accord. I will particularly emphasize the advisability of carrying out section 8 of these resolutions relating to the appointment, by the Federal Government, of *some medical man* well skilled in quarantine matters, to have supervision over the whole of the quarantine stations of the Dominion of Canada. Such officer I believe you already

possess in the person of Dr. Montizambert. I conceive that the interests of the Dominion in this matter could not be better conserved than by his appointment as Superintendent of the whole of your quarantine stations.

The Conference, however, stopped short when they formulated their recommendations concerning *Maritime Sanitation*, whereas they were distinctly asked to advise on Provincial Sanitation as well as the relations between the two. I made some remarks on this subject, drawing the attention of the Conference to the omission, the result being that Dr. Bryce formulated a resolution which was placed before the members of the Conference present and carried. I would prefer, however, to place my own views on this subject before your Department.

Two lines of defence should be adopted in preventing the importation of cholera in the Dominion of Canada. The first line of defence is what is generally understood as Quarantine Regulations. The experience of the world has proved that this line of defence can never be relied on exclusively. It is bound to have its weak points and loopholes through which disease of a contagious nature can gain access into a locality. While I recommended the enforcement of strict Quarantine Regulations in the Dominion of Canada, under the present circumstances I think that the second line of defence is equally or more important. This second line of defence consists in general terms of the internal preparation of the Dominion of Canada to cope with the disease of cholera if it should gain access to her shores. There are three points which constitute this second line of defence: first, that each city or town or municipality, as the case may be, should be placed, through the agency of its Health Officer or Local Board of Health, in as good a sanitary condition as possible; secondly, that the water supply of each town or city, etc., should be scrutinized with the utmost care regarding its purity and absence of any possible contamination; and thirdly, that every town having a population of over one, two or three thousand inhabitants should establish an isolation hospital.

In my opinion it would be well that these recommendations should have the authority and weight which would be conferred on them by emanating from the Conference which has been held.

The result of the suggestions which I make would be this: Supposing cases of cholera should be brought to the shores of North America in any number, it is almost a foregone conclusion that some cases of the disease would elude the vigilance of the quarantine and you would have these cases developing in one or more of the cities or towns of the Dominion. If any such case or cases should occur in a town in good sanitary condition, having a pure water supply, with the addition of an isolation hospital for the immediate removal and isolation and treatment of the case or cases, the community need have no fear whatever of the spread of the disease or of its becoming in any way epidemic.

I have also to notice that a resolution was offered, during my presence at the Conference on the evening of the 1st instant, recommending the various Provinces to appoint Provincial Boards of Health to deal with sanitary matters within each Province. At the same time, as I have mentioned before, the Conference has recommended the appointment o an *individual* to fill the higher position of general Dominion Quarantine Officer, and I agree with them in this recommendation, as I have before stated. I am of opinion, however, that what is right and proper and best as regards the position of Dominion Quarantine Officer is also best as regards the provincial health authority. In a word, that an individual with proper authority fills such a position better than a body of persons who are more or less irresponsible and unpaid for the work which they do. An army is better under the command of one general than it would be under that of half a dozen.

The Conference, by recommending, in one instance, vesting the authority in the individual, and in the other in a board of health, to a certain extent contradicted themselves.

I have, etc.,

JNO. C. DAVIE, M. D.,
Provincial Health Officer of British Columbia.

JOHN LOWE, ESQ.,
Deputy Minister of Agriculture,
Ottawa.

X. REPORT ON POLLUTION OF STREAMS.*

By the Secretary.

Mr. President, and Gentlemen of the Conference.—In discussing the subject assigned to me, I do not propose to enter upon an historic account either of the views that have been held, or of the attempts which have been made to solve the problem. I shall therefore endeavor to deal with its practical aspects which we as Executive Officers of Health, are naturally expected to be specially interested in.

Much has been written on the subject with a view to laying down general principles, intended to apply to the question of river pollution in all localities and under all conditions. I believe I am expressing the views of most here when I say that owing to this, probably more than to any other cause, we find ourselves to day met with statements and counter-statements as to the evil effects of such pollution, which have proved most detrimental to the advancement of public knowledge and muncipal improvement in methods of sewage disposal.

There exist, however, other and most serious obstacles which have obstructed the progress of the question. Some of these are :—

(1) Individual selfishness and municipal parsimony in dealing with the questions of public water supply and disposal of sewage.

(2) The various standpoints from which the subject is approached such as :—(*a*) that of the engineer ; (*b*) that of the health officer ; (*c*) that of the chemist ; (*d*) and that of the biologist.

The engineer seeks for the best point or points for an outfall toward which his sewer mains shall converge, and afford him proper levels in his laterals ; the health officer very properly is concerned in seeing that this outfall shall be so located, as to at least prevent a local nuisance or injurious effects to the residents of his own muncipality ; the chemist thinks, if a river water is no worse in organic constituents than many natural waters, that it is fairly safe, while the biologist is inclined to settle the purity of a stream off-hand by the number of living bacterial forms he finds present.

While difficulties such as those just pointed out may be said to attach to the consideration of any question, yet they have assumed special prominence in the subject of our discussion, since to each belong some one or more important elements in the formation of any comprehensive or correct conclusion. For instance if, in a swift-flowing river, sewage is deposited in the middle of the channel, the coarse materials having been retained in a pen-stock, and should water be taken from the river some miles down the stream, it may in some instances have been found possible to not only create no local nuisance, but to show no notable evidence of sewage contamination to the water supply below. Again, the chemist if he has in the above instance found the water below such an outfall improve with distance, asserts with much confidence that the sewage by sedimentation, oxidation, etc., has disappeared, and that the river water maintains its potable character. Similarly in the same instance, if trade refuse added to the sewage has served to prevent some of the bacterial forms, peculiar to a river water from being more abundant below than above such a sewage outfall, the biologist might similarly be slow to condemn such a river water for drinking purposes.

But if we view the question from, as far as possible, the totality of conditions which enter into it we are not long in seeing that in the very nature of things, no conclusion based on the several tests, as applied in the above case, is admissible ; since in all surface waters, but especially in streams, there is an almost daily variation in their local conditions, dependent upon drought, or rains and floods on their branches and higher reaches. These are local rains washing into the streams surface refuse recently accumulated and of dangerous character, or the dissemination from old sources of pollution, as sewers, recent materials having in them specific poisons, which may develop in any river or stream, and may suddenly give to previously inoffensive waters most fatal qualities. If engineers,

* Read before International Conference of State Boards of Health at Lansing, on June 6th, 1892.

chemists and bacteriologists were engaged daily with their various indicators in measuring changes of quality, and were they supplied with efficient means for correcting defects, then we might fairly conclude that with such regulators a river water supply would be safe. Such an ideal state has, however, not been reached ; and as executive officers we are bound to enquire more specifically into the matter, and to determine what attitude with our present attainments, we as sanitarians can best assume, and in what direction we must direct our energies.

1. *Evidences of Pollution Based upon Statistics of Disease.*—So general seems to be the opinion that cholera in its native haunts is conveyed by river water, and so universal the evidence of malaria being borne along in river waters from lagoons and shallow banks where organic vegetable matter accumulates and decomposes, that I shall not deal further with them. The case which interests most of us, and which may be said to be the crucial test of water pollution in temperate climates, is that of the dissemination of typhoid fever.

I do not propose to take up time in discussing the statistics of typhoid in all those cities north of the Ohio, situated on rivers below sewage outfalls, and strike an average, and thus settle the question for or against sewage pollution of river water from the evidence of an increase of typhoid deaths, (though I am certain a strong argument could thus be built up and probably will be by others on this discussion); but I shall take what seems to me a more difficult case as a test, viz., evidence from statistics that pollution of immense bodies of cold lake water, and of several river waters in cold weather is not only possible, but also that it does take place.

These diagrams (seen in chapter II part I) illustrate the first point, viz, that bays of great lake water, in itself the type of pure water both from the chemical, biological and experimental standpoint, are not only capable of becoming polluted, but in the instances given are also actually polluted to the point of being *comparatively* measured by death-rates great in comparision with those of cities supplied with the same waters but from points where at present contamination cannot take place.

The following are illustrative of the second point :—

(*a*) The Provincial Asylum for Insane at Kingston, Ontario, is supplied with water from a pipe laid into a bay of Lake Ontario at a point where a creek brings down vegetable matter.

The superintendent who for years has had the same experience, except that in recent years the use of a Hyatt filter has lessened the outbreaks somewhat, yearly expects that toward the end of January a fever will break out amongst the inmates, which for lack of a better he calls vegetable typhoid.

(*b*) During the autumn of 1887 the Ottawa river, a river only second to the St. Lawrence in size, and having its head waters on the water-shed to the south of Hudson Bay, was the occasion of disseminating a fever, commonly considered typhoid, in November, which in six weeks had caused 1,500 cases, or had affected one fifth of the total population between the susceptible ages of fifteen and thirty years.

(*c*) An outbreak, known as the Plymouth outbreak, occurred in Pennsylvania in March, 1888, the particulars of which are known to all.

(*d*) A curious outbreak, whose details have been given by Dr. Vaughan, who made biological experiments with the water, took place at Sault Ste. Marie, on the United States side, during the summer of 1890, although the waters of this, as the other great lakes, seldom rises, except along the shores, to a temperature above 45° to 50° Fah., even in late summer. As a presumed cause of this outbreak, a number of vessels had been temporarily, delayed for a week or so, anchored near the town intake pipe in Lake Superior, owing to a break in the canal.

I do not deem it necessary to enter into local details, but need only say that in every case, as Chicago, Cleveland, Toronto, etc., the intake pipe is in water fifty feet deep at least, hence in very cold water, and while, in at least the Toronto instance, the pollution may have been taken in through leaks in the pipe in the bottom of the bay, we have positive evidence from comparative statistics that, no matter how great dilution may be, if sewage can, by winds or currents, reach the intake pipe, it will show its presence in the death-rate of typhoid if germs exist in such sewage.

The following, I believe, will be found to be a law, viz.: "*That*, taking a series of years, the pollution of even relatively immense bodies of lake water which, having no regular flow, are liable to carry sewage to a water intake, will, at certain seasons, and with winds moving sewage towards the point of supply, cause outbreaks of typhoid of a more or less epidemic character." I further believe that we can establish from the above-mentioned diagrams another law, viz.: "*That* in cities obtaining practically all their drinking-water from a public supply, whose source is beyond the possibility of contamination, typhoid fever will practically disappear from the list of causes of mortality."

2. *Causes and Conditions of Pollution of Streams.*—What I have just stated as being what I believe will prove two laws regarding pollution of streams applies, of course, to the great source which, as sanitarians, we are so directly interested in, viz., sewage.

But there are several other causes or sources which play an important part in this pollution, and which vary notably both as regards different streams and at different points in the course of the same streams. Referring to the first, it is manifest that a mountain stream issuing from the foot of some glacier, or as a spring flowing as underground water from clefts in the rock, or appearing on the hill-side from some water bearing sand on the top of impermeable clay, and flowing thence in channels cut through rocky beds or layers of clay, will not bear down either in suspension or solution any notable amount of vegetable organic matter. As, however, these or other streams speed on their courses to the plain they not only keep constantly receiving soakage from swamps and forest vegetable detritus, but they are constantly washing, in some districts, alluvium from their banks, and where they pass through cultivated regions tend to receive more and more the surface washings from manured fields, barn-yards, etc., and direct pollution from cattle and other animals which have access to them. Owing to the constantly changing character of the bed along many streams it is, however, common experience that the waters of such show at different points varying amounts of vegetable pollution. We are aware, for instance, how the moorland water of the highlands of Scotland, the lake district of England, the Adirondack and Laurentian regions of the United States and Canada, have always presented, in analysis, an amount of vegetable pollution enormously greater than is often found in other rivers, which are looked upon with suspicion as sources of public water supplies.

Take for comparison an analysis of the water of the great lakes or in the St. Lawrence, and of the Ottawa, whose different waters flow along side each other, the blue of the one distinguishing it for miles from the reddish hue of the other.

Analysis of water in Lake St. Louis.* This lake receives both rivers, but the waters do not mix for miles.

——	Total solids.	Loss on ignition.	Albuminoid ammonia.	Free ammonia.	Chlorine.	Oxygen in 4 hrs.	Oxygen in 15 min.
Lake St. Louis—Ottawa River Water....	72	32	0.238	0.030	1.00	5.688	3.128
Lake St Louis—St. Lawrence River Water	128	48	0.130	0.014	3.50	1.280	0.628

Manifestly, therefore, other very different elements enter into the problem than that of excess of vegetable organic matter. Speaking generally from the sanitary standpoint those streams possessing frequently excessive amounts of vegetable organic matter of a humic character have come to be recognized as in themselves wholesome, and to be placed in northern latitudes in a very different category from many other streams, showing much less impurity of this kind. As illustrations I give the analysis of three different waters. The first is from an inland river, taken from under the ice in February, the river flowing from a lake of considerable extent, with swamp along its borders.

* By A. McGill, B.A., Chemist, Department of Inland Revenue, Ottawa, Ontario.

Analysis of Scugog Water Above Lindsay.

	In parts per million.
Free ammonia	0.72
Albuminoid ammonia	0.38
Chlorine	6.00

The second is from an artesian boring through blue clay to a water-bearing sand above Hamilton shale. It is used as a public water supply.

	In parts per million.
Free ammonia	0.40
Albuminoid ammonia	0.08
Chlorine	202.0

The third is Chicago public water supply after a week of south-westerly winds, the river being two feet higher than the lake.

	In parts per million.
Free ammonia	0.011
Albuminoid ammonia	0.088
Chlorine	1.888

The analyst of the latter water states that the water supply is taken from a point two miles from the shore line. The albuminoid ammonia in water taken from the crib seems no greater than in water taken several miles further out.

Such waters, however, frequently present different characteristics, quite apart from the question of sewage contamination dependent upon the amount and nature of the inorganic sediment which they contain. As this varies from arenaceous to cretaceous or to argillaceous we find very different degrees of precipitation of this vegetable organic matter—clay precipitating with comparatively great slowness.

The well known differences are illustrated in the enormous settling basins which cities using such waters as the Missouri require, if the water is to be freed from its inorganic materials; or in the aid to sedimentation now made use of by water companies using artificial filters. But these river waters having high amounts of vegetable matters possess therein elements which, while harmless in themselves, may become the condition whereby most extended outbreaks of fever may result. Deposited in lagoons they are, with the retreating water, subject to decomposition in the summer, and being borne down by the next freshet, may become the occasion of malaria and dysentery of the most serious character. But what is yet more common in our northern cities is that at some point or other in their course these rivers receive specific typhoid contamination from sewage. I have in mind such a case as that of the Ottawa in 1887. A water-race had been blasted from the rock for about half a mile along the river bank to obtain power to drive the engines. Along the bottom of this race was laid a large wooden conduit into the river above. During the investigation into the outbreak the committee, learning of the suddenness and general dissemination of the fever throughout the city, at once concluded the outbreak was due to water poisoning.

The engineers and many local medical men laughed at the idea of the majestic Ottawa carrying typhoid. When, however, the conduit was examined the next year the following condition, as stated in the engineer's report, was found :—

"I had it examined by a diver, who reported a large number of small holes in the pipe, and he cut out two small pieces of the wooden staves, which showed that they had been eaten or worn away from some cause which I could not then determine. In order to be doubly sure I employed another diver, and he reported the pipe in a very bad state throughout its entire length. He took out more pieces of staves which were even in a worse state than the first. I then had the inlet to clear water tightly closed, and found that the pumps ran for over one hour without any perceptible change in the gauge level, thereby clearly showing that the water pumped into the city was drawn direct from the the aqueduct, and not, as intended, from the inlet of clear water pipe."

The Lowell and Lawrence outbreak in Massachusetts in 1890 is a similar instance, although the pollution, especially of the Lawrence water, had for years given these towns an unenviable notoriety in the matter of typhoid prevalence. The following extract from the annual report of the Massachusetts State Board of Health for 1890 well illustrates this point of the results of sewage pollution :—

"These are the only two cities in the State which draw their water for drinking purposes from a river, into which, within twenty miles above, sewage is publicly discharged."

"The amount of sewage that has directly entered the river and its branches during the chemical examinations of the past three years is estimated to be about one gallon in six hundred of the river water passing Lawrence, and there has been no more impurity in the water that could be detected by chemical analysis than in about one-half of the drinking water supplies of the State obtained from ponds and streams; but the facts which have been presented showing that these two cities have so much higher death-rates from typhoid fever than any other cities of the State, together with what is known of the relation of typhoid fever to sewage-polluted drinking water, are the strongest grounds for concluding that, even with the smallest amount of organic impurity in the water, as shown by chemical analysis, the disease germs of this disease are able to pass and do pass from one city to the other in the waters of this river."

The details of an outbreak in the cities along the valley of the Tees, in Yorkshire, England, which occurred in August and September, in 1890, are so admirably set forth in the report for 1891 of the Local Government Board of Great Britain that I cannot forbear referring to them.

The outbreak began in August, 1890, a great increase in the typhoid cases for the fortnight ending September 20th being noticed, which increase continued till October 4th. In four weeks 570 cases occurred in 350 houses. In all the area, made up of some thirteen registration districts, there was a total population of 520,000, nearly of all of whom were supplied with water, passed to subsidence tanks, thence through sand filter beds, from the Tees. It was supplied by two water companies, their intakes being but a few score yards apart, at a point two miles above Darlington at Broken Scaur. The amount of water daily pumped was about 11,000,000 gallons.

During the four weeks the exceptional prevalence was limited to the areas so supplied, 41,000 houses being supplied by the companies, 6,000 were supplied from other sources. The rate of excess was calculated by the house—there being twelve cases per 1,000 in those supplied by the city, and less than one per 1,000 in houses supplied from other sources.

What was remarkable was that several hamlets along the river above getting water out of the river, but not from the water company, escaped.

Above the source of supply, the drainage area of the river covers three hundred square miles and the water flowing past the pumping station in times of drought amounts to 45,000,000 gallons. Over this drainage area are scattered 15,000 persons in numerous villages and farm houses. Some fifteen to twenty villages up to Barnard Castle are situated along the river. The nearest is half a mile above the intake pipe, 33 houses whose drainage runs into an old cess-pool with an overwash during rains into the river. The next town is two and a-half miles up the river with sixty houses; and the next six miles up with 170 houses.

The sewage from the last has its watery portion flowing over into the river, the rest drying alongside of a ditch which is washed out with floods.

The next town is seven miles up, and the next is ten miles with 300 houses polluting a branch of the Tees. At fifteen miles above is a town of 1,000 houses.

The heaviest rainfall in the valley during the period occurred in the fortnight ending August 23rd. The river was in flood on the 13th, also on the 23rd.

The rainfall of the 23rd is exactly parallel with the incubation period of typhoid, which preceded this general diffusion. The town authorities have for years recognized the liability of the river to severe pollution, which occurs during flood time. In 1887 analyses were made biologically and chemically, the report of which states "That on a sudden rise of the river's flow, and for 48 hours after its onset, there is a great increase of organic matter at the pumping station—and abundant evidence of unaltered sewage."

"The filtering processes greatly reduce the amount of organic matter, but during high water the town water shows presence of organic pollution, which is in part composed of fresh sewage unaltered."

None of the towns above suffered from any epidemic of typhoid during this period, although several isolated cases had appeared.

Dr. Barry concludes his report with the following conclusion :

"That if the sewage and excremental and other refuse were kept out of the river, the danger of specific pollution would be greatly reduced, but even under these circumstances it is still doubtful whether a water pumped from a river at a point upwards of forty miles from its source is anywhere in this country a desirable supply for drinking purposes.

From these and hundreds of other outbreaks which have been more or less closely studied, it must be apparent that the soundness of what I have laid down as a law of pollution can scarcely be question.

At this point we are, however, met with the sceptical enquiry, how, if what is here stated be true, does it happen that our towns are not decimated by constantly recurring outbreaks of typhoid? I shall therefore endeavor to set forth what appear to me to be the chief reasons.

3. *Why Polluted Streams Fail to Produce at all Times Outbreaks of Typhoid.*—Notwithstanding all that theory would lead us to infer with regard to the causes which lead to outbreaks of typhoid, it may be here said with perfect truth that there have been and are many local conditions, which viewed generally seem so bad as to inevitably cause outbreaks of typhoid, and yet which have failed so to do. Believing as I do, and as I believe most here do, in the production of the disease, only by some one or more specific species of microbe, it becomes incumbent upon us to endeavor to supply some rational explanation of these cases of local temporary or continued immunity from outbreaks of typhoid. I shall endeavor to give what appear to me to be some of the reasons therefor in their natural order.

1. The temporary absence in the polluting sewage of some towns of the specific microbes from pre-existent cases. This may fairly be assumed from the facts, frequently published that when the excreta from cases have been known to obtain entrance into wells, into small streams, etc., they have seemed to be the occasion of outbreaks where with the same polluting conditions few or no cases had previously appeared.

2. The much more frequent case, where, although such microbes do reach streams supplying public water, the natural agencies inimical to their multiplication have preponderated. What they are is but partially known. By bacteriologists we are assured that water-bacteria are hostile to the development of typhoid germs · from others we learn from their experiments, that while the diphtheria bacillus is not soon affected by sunlight, yet the typhoid bacillus soon disappears if exposed in liquids to sunlight.

3. Another, and I believe, a most potent cause for their non-multiplication is temperature; and in this way that with a warm temperature water-bacteria are present in streams in incredible numbers, and do then very probably prevent the development of typhoid bacteria, aided by the presence of sunlight.

That there are temperature conditions, however, most favorable to the development of typhoid bacilli seems to me to be proven beyond all doubt by the history of what we often term *typhoid* wells. Probably every one of us is acquainted with one or more such wells which, as the latter summer months come around, cause local outbreaks of typhoid. In the north these are almost invariably shallow wells fifteen to twenty-five feet deep or less. In such the normal water-temperature of say 51° F. slowly increases, the depth of water and therewith the dilution of the filth in the well becomes less; and the annual outbreak of typhoid occurs. Here are increased pollution, increase of temperature and absence of light, the necessary elements for the development of the germs of the disease which have lain dormant in the well. In streams, such conditions do not exist together with anything like the same frequency; and hence it is that in warm seasons it seems principally when floods bear down an increased pollution, or when drought by evaporation produces much the same conditions that river typhoid develops most freely.

4. To these conditions Pettenkofer and others with him, adds a most important agency in the abounding vegetable life of streams, which according to this author continue their purifying effects on the waters of German rivers even in winter. For two reasons this same infusorial life in the cold rivers and lakes (except small lakes and ponds) of the north does not in winter seem to carry on its beneficent work, as seen from the facts first, that in our frozen rivers the vegetable organic materials present in solution are at times in excess, and sewage will flow unaltered for many miles under the ice, and second, because as seen in most notable instances as in the Ottawa outbreak, as also a most serious outbreak at Sarnia on the St. Clair River, and at Plymouth, Penn., river epidemics of typhoid have occurred from the river water at winter temperatures.

5. Another and most potent element in the prevention of outbreaks is constantly more or less in operation, viz., sedimentation. Polluted swift flowing streams may really be more dangerous than sluggish ones. Buffalo sewage is readily detected in the Niagara River at the Falls, and the river water at Fort Niagara at the mouth of the river shows some evidences of its presence. In so cold a stream decomposition by natural processes must of necessity as in winter be delayed and sedimentation cannot well take place, enormous dilution being the special element of safety in this case.

In sluggish streams with detritus from the banks of creeks and rivers, sedimentation in such waters is enormous; but when in winter this does not greatly take place the sewage may, with whatever germs it contains, be carried along to a public water supply unaltered, and being drunk with the water produce, as in instances cited, epidemic effects.

6. Another accidental element in the prevention of outbreaks is that of currents. Currents in streams as in lakes, although perfectly understood by fishermen and every amateur yachtsman and harbor-master, are to the engineer and scientist enigmas as difficult to understand, as is the historic flea to catch. As popularly stated, "you put your hand on it and it isn't there." This has been elaborately illustrated by the results of a series of float, temperature and bacteriological experiments carried on during the past summer in Lake Ontario along the Toronto water front. We had been told by some the currents set westward, by some eastward, and so on; but the results showed in every case that surface wind currents ultimately determined the direction of the deep-water floats, that surface warm water was with certain strong winds drawn out into deep water by an undertow, and that these currents if bearing sewage would undoubtedly temporarily pollute the city water supply.

These same surface wind currents will similarly to some extend affect every river current, and while it may be true that a water pipe laid in deep water in mid-stream will escape much surface sewage pollution, it is no guarantee that such will always and invariably continue to be the case. Indeed in ponds and sluggish streams it has been shown by the Massachusetts State Board experiments that the deeper waters are often most polluted. Hence while the pollution of a stream is such as to cause most positively deleterious effects it will depend upon the relative location in the stream of the sewage current, and the current at the point whence the water is taken, whether the pollution will be much or little, constant or intermittent.

7. The last of the reasons I give here is that on which so much has been spoken and written, artificial removal of pollution. Artificial purification of some kind or other has been too long practised for us as sanitarians to ignore its utility. In an article at the recent Water-Works Association in Brooklyn on the Brooklyn Water supply the source of that wonderful underground supply and its freedom from contamination was set forth. There is exhibited the great natural system of intermittent downward filtration. It is nature's, and like everything that nature does if allowed her own time, it is perfect.

There is illustrated what is arrived at by water companies. They attempt it in various ways. The great London water companies have beds of sand acres in extent, through which water is not allowed to pass by law faster than at the rate of 8 cubic feet of water per cubic foot of filter area per day. This method is manifestly crude as some

days the clear river water may be well purified ; at others this may be with increased pollution, imperfect. How imperfect such a filter may be is seen in the Tees epidemic already referred to, and to that related at the International Congress of Hygiene by Dr. Kümmel, of Altona, below Hamburg.

This system has been reduced to something more scientific at Berlin, where the action of the filters is measured by plate-cultures made by the officers in charge ; but what kind of a check valve is put on I do not know ; and of how great practical utility it can be I cannot readily conceive ; since if floods brought down excessive impurities, and the degree of bacterial pollution would require at least 24 hours to be measured, the river might be clearing by the time special filter beds were brought into requisition. However, it marks a positive advance in knowledge of the life history of the Spree at that point. That the results are far from complete is seen in the plea raised by Pettenkofer and others for a Rivers Commission to be appointed by the German Government to study in detail each river supply in relation to the towns supplied.

What sewage-farming has already taught us in the old world and what Massachusetts experiments have recently demonstrated, indicate that along quite another line than that of mechanical filtration it is possible to approach nature's method of intermittent filtration, which in my opinion is most economically carried out by letting nature measure the extent of grounds required and then by our taking the filtered waters from their native bed, as underground waters where contamination is impossible.

Basins for sedimentation, have in the past and must still in the future play an important part ; but they are of necessity, except at great expense, always a crude and imperfect method. During the past year I have had an opportunity of experimenting with an artificial filter under pressure, and have to state it as my belief that there are very great possibilities in store for this method.

At St. Thomas the water supply is obtained from Kettle Creek filters by means of Hyatt filter. The Hyatt system consists of the addition of a small quantity of alum for each gallon of water before filtration, thus clarifying it considerably by the formation of a precipitate. It is claimed that this precipitate in falling entangles and brings down with it the bacteria, so that they are more easily removed by filtration. The filtration takes place through sand contained in large horizontal cylinders, provision being made for the reversal of the stream of water once in twenty-four hours, so as to thoroughly cleanse the filters.

In St. Thomas there are two of these filters, each with a filtering capacity of 500,000 gallons, and they are at present putting in an additional one. The following are some of the results :—

July 3rd	Before filtration	45,000	per c.c.
	After filtration	90	"
Oct. 23rd	Before filtration (average)	1,240	"
	After filtration (average)	44	"
	Pumping at the rate of 1,324,800 gallons per 24 hours.		
Oct. 24th	Before filtration (10.30 a.m.) (average)	1,380	"
	After filtration (10.30) filter 1 cleaned at midnight	59	"
	After filtration (10.30 a.m.) filter 2 cleaned at 10 a.m.	270	"
	After filtration (11 a.m.) both filters together	65	"
	Pumping at the rate of 810,720 gallons in 24 hours.		
Oct. 26th	Before filtration	1,545	"
	After filtration	70	"
	Pumping at the rate of 794,880 gallons in 24 hours.		

These results show a high degree of efficiency in the filters, as in the case of the examination of Oct. 23rd the pumps were sending water through the filters at a rate about one-quarter as fast again as they should.

The reason why they do their work is perfectly easy to understand, but the work to be done increasing almost daily it is likely to be found in practice—as, indeed, with all artificial methods—that the filters will be forced to try and do more than they can perfectly and with success accomplish.

Having, then, at some length set forth—

1. Why the question of pollution of streams has so long been one of controversy ;
2. Some of the evidences of pollution of streams, based upon statistics of disease ;
3. Some of the causes and conditions of pollution of streams ;
4. Why some streams fail to produce at all times outbreaks of typhoid ;

We may very briefly endeavor to sum up the question which we started out with, viz. :—

What attitude with our present attainments must we as Officers of Public Health assume in regard to the pollution of streams by municipal sewage and in what direction must we specially direct our energies ?

Doubtless for the present our action is limited on its executive side by the statutory enactments peculiar to each State or Province, but inasmuch as legislation is dependent ultimately upon the views we hold on these subjects, it is always possible and necessary to exercise on municipal authorities an influence which will materially aid in obtaining general enactments which will govern the disposal of sewage generally.

It is quite apparent that the density of population as it varies in different states and in the same state with increasing years of settlement, is the element which more even than preconceived scientific opinion forces upon the public and thereafter the legislature the discussion of what constitutes pollution and of what measures are to be adopted for preventing or regulating existing pollution. It would be most fortunate, however, if new states and provinces just entering upon the work of city-making should tend to copy legislature which has been forced upon older states, since the many questions of vested municipal rights and the interests of riparian owners could at such a time be adjusted in a way which at a future date may be found impossible without costly litigation.

The considerations already presented make apparent the fact that we need not expect off-hand to set down conclusions as regards details, which would be either universally applicable or accepted on all hands as correct. To illustrate this I quote one or two expressions of opinion by prominent sanitarians. Dr. Barry has stated that in his opinion " It is still doubtful whether in England any river forty miles from its source can be considered a safe source of public water supply," and yet the Government official water examiner states that more than fifty per cent. of the water supply of Greater London is taken from the Thames, and that the sewage of over 70,000 people was delivered direct in the river at points above the intake.

As already stated, Pettenkofer and others with him have concluded that Munich may be allowed with safety to drain into the Isar " without any hygienic disadvantages to the inhabitants." This opinion seems to have been based upon the following experiment—water was taken at Thalkerchen, a point on the river above Munich, and also at Treysing, below the city. The water showed precisely the same qualities. He adds, however, " Of course, the natural chemical quality of any given water, as also the character of the river bed, its vegetation and strength of current—these would play an important part in the work of purification. Simple chemical, physical and biological influences must all be considered."

W. Kuemmel, C.E., of Altona, holds, however, views strongly opposed to this. At the London Congress he related the details of an epidemic of typhoid at Altona, which city takes its public supply from the Elbe after a careful filtration. The city is situated below Hamburg. It appears, according to this statement, that the latter city takes its water from the river without filtering and with comparative safety. (This paper was written before the cholera epidemic.)

Without multiplying opinions as to the natural purification of streams, which chemical analysis shows goes on in many streams owing to processes already referred to, I quote, as bearing upon the point, the words of Fred P. Stearns, engineer to the Massachusetts State Board of Health.

*" With larger volumes (of water) the pollution (from 2.5 to 7.0 cubic feet per second per 1,000 persons) is so small as to be clearly admissible from the standpoint of the offensiveness of the water." Then he adds : "In a stream used for domestic water supply it cannot be said, with our present knowledge, that any degree of dilution will make the water entirely safe for use."

Whatever views, therefore, may be held on the various points coming up for consideration in connection with the disposal of the sewage of any individual municipality, the following three general propositions will, I have no doubt, meet with general acceptance :

1. That, as is stated in "An Act to protect the Purity of Inland Waters," passed by the Legislature of Massachusetts, 1888, "The State Board of Health shall have the general oversight and care of all inland waters. It shall recommend measures for the purification of such waters, and for the removal of substances and causes of every kind which may be liable to cause pollution thereof," or as stated in the Public Health Act of Ontario, "Whenever the establishment of a public water supply or system of sewerage shall be contemplated by the council of any city, town or village, it shall be the duty of the said council to place itself in communication with the Provincial Board of Health, and to submit to the said board before their adoption, all plans in connection with the said system.

"It shall be the duty of the Provincial Board of Health to report whether, in its opinion, the said system is calculated to meet the sanitary requirements of the inhabitants of the said municipality ; whether any of its provisions are likely to prove prejudicial to the health of any of the said inhabitants, together with any suggestions which it may deem advisable ; and to cause copies of the said report to be transmitted to the Minister of the Department to which the said Provincial Board of Health is attached, and to the clerk of the municipal council, and the Secretary of the Local Board of Health of the district interested.

"No sewer, or appliance for the ventilation of the same, shall be constructed in violation of any of the principles laid down by the Provincial Board of Health, subject to appeal to the Lieutenant-Governor in Council."

2. That those municipalities situated within the same drainage area, where streams, polluted with sewage from one municipality become, or are likely to become sources of public water-supply for other municipalities, be by law united by an Order-in-Council of the Governor upon the report of a State or Provincial Board into a Rivers Conservancy Board, said Board to act in conjunction with the State or Provincial Board in the consideration of town water supplies and sewage disposal within the area.

3. That in cases where rivers, lakes, etc , form interstate, interprovincial or international boundaries, or where the course of such passes from one State or Province into another, that interstate or interprovincial action be encouraged ; and that in those cases where streams come within the control of a Federal Government, such Government should urge interested States and Provinces to similarly appoint Conservancy Boards.

Amongst other conclusions, which I believe the facts warrant us in drawing, but upon which there may be differences of opinion are the following :

1. That no water into which sewage flows can at all times, and under all circumstances be considered safe for domestic supplies.

2. That there are streams and lakes, such as the Great Lakes, of such enormous volume that it is as yet possible to pour sewage into them and yet use their waters for public supply ; but that this can only be done in those cases where such distance intervenes

* "The water supplied from the Thames to London is all submitted to the purification processes of subsidence and filtration, the filter beds of the different companies vary in detail, but are all constructed upon the same plan ; for example, the four filter beds of the West Middlesex Company (6 acres in total area) at Barnes, have a total thickness of filtering medium of 5 feet 3 inches, consisting of 2 feet 3 inches of Thames sand, 1 foot of Barnes sand, and 2 feet 3 inches of gravel of various degrees of coarseness ; beneath the filter beds there are collecting drains of 6 inches in diameter ; they are pierced and laid 20 feet apart.

"Efficient filtration largely depends on the rate of flow of the water through the filtering medium. It is laid down as an accepted standard that the rate of filtration forming metropolitan waters should not exceed 540 gallons per square yard of filter bed each 4 hours, or 2 gallons per square foot per hour. Some of the London companies at the present time infringe this rule, and the filtration in practice is slower than the above."

as shall allow time for the natural purification of water to have completed itself, and that this can only be known after careful and extended experiments, chemical, biological and baeteriological, in addition to currents and temperatures, carried out in different seasons, and under the varying conditions of flood and drought, etc. .

3. That where ordinary streams in well settled districts are required to be used for public purposes owing to the lack of other source of supply, that every effort be made by Boards of Health to have the gathering grounds and sources of supply kept free from all forms of animal pollution ; and hence would urge that modern methods of sewage disposal, notably those of intermittent filtration, or precipitation with subsequent filtration, be forced upon the attention of cities and towns contemplating having sewerage works.

4. That few river waters are fitted for use without sedimentation, and filtration either by natural sand filters or some mechanical filter, as those through sand operate under pressure.

PART III.

ANNUAL REPORTS

OF

LOCAL BOARDS OF HEALTH.

CITIES.

Belleville.

Medical Health Officer's Report.

I beg leave to report that, in the spring, I had the usual notices issued for the cleaning of yards, emptying and disinfecting water-closets, etc. The public responded fairly well to the notice. The Inspector gave each police officer a ward to look after, and he made a house to house inspection of his district, so that every part of the city was thoroughly looked after. Any nuisance found was ordered to be abated. I may say that, during the past year, the work of emptying and disinfecting privy pits and cesspools, has been more thoroughly done and observed, than in any previous year for some time past. Just here, I wish to thank the Inspector and his assistants for the prompt assistance given me, in the discharge of my duties, whenever required.

I have had reported to me, up to the 1st of December, twenty-six cases of typhoid fever, with three deaths; seventeen cases of scarlet fever, with one death; forty-five cases of measles, with no deaths; twenty five cases of diphtheria, with four deaths. In all cases of infectious diseases, when reported, the houses were promptly placarded, and all necessary precautions taken to prevent the spread of them.

During the spring, there was an outbreak of typhoid fever on Cedar, Ernest, and North Bridge streets, some 12 cases in all. My attention having been called to it I, with the Inspector, made a personal inspection of dwellings and yards of the sufferers, inquiring more particularly, where they obtained the water for drinking and household purposes, and found that the majority of them obtained the water from a well, known as the Cedar street well, on Cedar street. We inspected the dwellings in the locality of the well, and from the surroundings decided that the well was the source of the trouble. The parties were warned not to use the water, as we considered it unfit for use; they, therefore, stopped using it and no other cases occurred after that. I at once called a meeting of the Board of Health, and laid the facts before them. The Board ordered the well to be closed up. Doubt having arisen as to the well water being bad, I sent two samples of the water to Toronto to be analyzed, and received a report from the analyst stating that the water contained a large quantity of animal matter and was unfit for domestic use. I then caused the well to be closed permanently.

I would suggest to the council the advisability of closing up, as soon as possible, all the public wells on the streets, they being in my opinion, from the position of the drains in the streets, very likely to become contaminated, and to be a source of danger to the people. I would again urge the council to proceed with drainage as soon as possible, and would particularly call their attention to several places, which should be attended to at once: 1st, the Guin street drain; extension of drain on Foster avenue from corner of Bridge street to the bay; drain on George, William, Albert, Ami and John from Alexander to Dundas, thence to the bay. My reasons, for mentioning these streets more particularly, are that a greater portion of the inhabitants have the water works water for domestic use as well as for water-closets, and have no proper service on the streets named to carry off the sewerage, which must be, in my opinion, dangerous to the health of the inhabitants in that locality. I would also strongly urge the council to extend the sewer from the corner of Hotel up Front to the upper bridge, giving relief and health to those living on that part of Front street. Also at the G. T. R. station, the drain from Brassey street should be deepened and carried to the river. A quantity of stagnant, filthy water lying in the drain on Foster avenue during the summer being, in my opinion, the cause of several cases of diphtheria and scarlet fever, which has been more prevalent in that

locality for the past year, than other parts of the city. I would again urge the council to pass a By-law doing away with privy pits for the whole city, and if that cannot be done would strongly urge the absolute necessity of one being passed to close up and thoroughly disinfect, all privy pits on Front and Pinnicle streets, from the wharf to the upper bridge, and putting in the dry earth closet system. My reasons for so asking are these: we all know that owing to the shallowness of the soil in the locality mentioned, there not being over three feet of soil to the rock, the ground has become thoroughly saturated with animal matter. Cholera, diphtheria, scarlet and typhoid fevers breed in just such a soil, and it being almost certain that cholera will make its appearance next spring, it will be criminal neglect on the part of the council and Board of Health, if they do not do everything in their power to prevent it getting a foothold in our midst, by placing the city in the best sanitary state possible, so that, if cholera should appear, we will be prepared to meet and control it.

I would again request the council to pass a by-law licensing one or more scavengers for the city to remove all garbage, night soil and other refuse, and at once to provide a proper dumping ground for the depositing of the same. It is impossible to keep the city clean and healthy without such a place. The city owns several water lots, which could be used for such a purpose, if proper rules were adopted for the management of the same, and a man appointed to look after it.

The mortality of the city has been lower this year than for some years past, the deaths being, from November 30th, 1891, to November, 1892, 152.

The slaughter-houses have been kept clean and regularly inspected, and no complaints have been make regarding them for the past year.

I issued some forty notices for the abatement of nuisances, which were served by the police and myself personally.

Complaints have been made to me of the unsanitary state of some cellars on Front street. In a great many cases the cellars are lower than the drains, and consequently water lies stagnant in the cellar. I have ordered all cellars to be filled up to the required height, and the drain to be properly trapped, so that there can be no escape of sewer gas into them. The market square has not been kept in a proper state this past summer notwithstanding attention has been frequently called to it. I would suggest that it should be thoroughly swept with the street broom at least once a week during the summer months, and all decayed vegetable and other matter be carted away after each market day.

In conclusion, I would again urge the city council in the matter of drainage. Fancy the arrival in the spring of that dread scourge, cholera. Let us do all we can to place the city in such a state, from a sanitary point of view, that if it should make its appearance in our midst we may have the satisfaction of knowing that we are to a certain extent prepared for it, and placed the citizens generally, in as favorable position as possible to prevent its spreading or getting beyond our control.

R. TRACEY, M. D.,
Medical Health Officer.

BRANTFORD.

Medical Health Officer's Report.

I have the honor to present the following report for the year ending November 1st, 1892:

Mortuary Statistics.—The number of deaths in the city during the year was 221, which gives a rate of 14.3 in an estimated population of 15,400. Twelve of these deaths were of persons over 80 years of age, 30 over 70 years and 51 over 60 years, 55 were under 5 years and 48 under 1 year.

The deaths from zymotic or preventable diseases, including cholera infantum and consumption, were as follows, with comparisons for five previous years :

——	1892.	1891.	1890.	1889.	1888.	1887.
Typhoid fever	2	6	11	9	13	8
Diphtheria	3	5	6	13	10	19
Scarlet fever	1	1	.....	1	.....	2
Measles	.....	.....	1	1	1	.....
Whooping cough	1	1	1	4	5	7
Cholera infantum	13	20	10	18	26	33
Consumption	22	2	22	18	17	21

There were in all, 55 cases of typhoid fever reported, most of the cases have been very mild. The two deaths occurred, one in November and one in December, 1891. Not one of the above 55 reported cases was fatal, and in fact from January 1st, 1892 to December 1st, there was no death from typhoid. One death unfortunately occurred on December 4th, inst. The disease was contracted in another town, but the death is necessarily recorded in Brantford.

The effect of this material reduction in the amount and severity of typhoid fever upon the number of patients in the hospital, has been very marked. There are at present, December 5th, 12 patients only altogether, and the number throughout the fall months has not been over half the number of previous years.

Of the 55 reported cases of typhoid fever, 45 had been using unboiled water of Brantford wells, one had used well water at Cainsville, and two had been living in Chicago and using the city water there. The remainder had been using Brantford city water. Four of these seven cases, which had been using Brantford city water, were in one dwelling house which had a sink and bath discharging into an unventilated soak pit, which had not been emptied for several years. The house was, owing to this, badly contaminated. The remaining three cases which had used city water, were all in another dwelling. At this place, a well at the kitchen door had been discontinued, but instead of being filled up had been kept as a receptacle for liquid refuse from the house and stable. There was also close to this dwelling, an old cistern in an offensive state. I am glad to state that in both of these cases sewer connection has since been made, and the unsanitary condition removed.

It is idle to expect that even the unusual use of pure water will prevent the recurrence of filth diseases, if such grave insanitary conditions are allowed to exist. The above named facts require no comment. I may, however, before leaving the subject of typhoid fever, mention the fact that one of our Brantford nurses was sent to Tilsonburg some time since to nurse a case of typhoid fever. I have ascertained that the well water used by the family, and for some time by this nurse, was bad. She contracted the fever, returned to the hospital, and I deeply regret to say, her case terminated fatally last Sabbath morning.

Miss Waite was a thoroughly qualified and excellent nurse, she had the most gentle and gracious manner and her heart was in her work. Largely through her efforts her patient at Tilsonburg recovered, but her young and precious life was sacrified. Her death is a public loss, and she died from a preventable disease due to bad sanitary conditions.

Diphtheria and Scarlet Fever.—As shown in the table above, there were in the year ending November 1st, only two deaths from diphtheria and one from scarlet fever. The whole number of cases reported was, of diphtheria 49 and scarlet fever 29. On the occurrence of any cases of these diseases, every effort has been made to prevent their spread by notification, disinfection, exclusion from schools, by isolation so far as possible, and in fatal cases by prompt and private burial under stringent precaution.

A considerable degree of success has apparently attended these efforts for several years up to the end of the statistical year.

I regret to say that the record for the coming year beginning on November 1st, ult., promises to be not as favorable. There were, in the month of November, five deaths from

diphtheria, and it may be impossible to prevent the further spread of this disease. Diphtheria and scarlet fever are filth diseases. Whatever may be the first origin of the germs of these diseases, their development is undoubtedly due to filth. All cases of these diseases either arise where some bad insanitary condition exists, or if occurring where the the sanitary conditions are good, they are communicated by personal infection, or by means of domestic animals or are conveyed by milk, water or other ingesta. In the present epidemic a majority of the cases have arisen in houses having sinks or baths mostly connected with filthy drains discharging into cesspools.

I give one or two examples, out of a large number of cases, illustrating this fact. In one dwelling in which three cases of diphtheria were recently reported, it was found that the bath waste discharged into an abandoned well, carefully sodded over and admitting of no ventilation, except back into the bath room A bed was temporarily placed in this room, and in six days the occupant was taken down with diphtheria, later on two others of the family took the disease. In the Orphans Home, diphtheria broke out some three years ago. On inspection, it was found that the lavatories and sinks discharged through a filthy wooden box without any trap, into a soak-pit. The matron complained of the offensive atmosphere in the house especially in the mornings. The pit was filled up, and disposal of the wash water on the grass and shrubbery was advised A few days ago scarlet fever broke out in this home, and on inspection it was found that a new soak-pit had been excavated and the old system re-established. These cases are samples of many others, and it is obvious that any degree of immunity from these diseases can never be expected. if such dangerous nuisances are not abolished.

I believe it is safe to assert that in no city in Canada are, notification, exclusion of affected or suspected cases from school, disinfection, etc., as well carried out as they are in Brantford. But I also am compelled to say, that so far as I can learn, Brantford is the only city in Canada which refuses hospital accommodation to cases of diphtheria and scarlet fever. The most effective known means for arresting an epidemic at its outset is thus denied us. Here is a danger which menaces every home in Brantford, and I have in previous reports earnestly, but without effect called attention to it and to its remedy.

It would be easy to cite any number of instances illustrating this danger, I shall merely mention the last one I know of which occurred within a few days. A young girl eleven years of age, in a poor family, was attacked with diphtheritic croup. The dwelling was beyond the city limits, and there was no notification. Two sisters who were relatives of the patient, and who were domestic servants in two different families in the city, where they had the partial care of young children, assisted in nursing the diphtheritic patient, being allowed to go there on alternate nights. After some days, one of the sisters on going to a doctor's office, was found to have her throat loaded with a mass of diphtheritic exudation already in a putrid state. The employers of these sisters looked with terror on the idea of their remaining in their homes, and they both found refuge in the little cottage in the suburbs, containing only three small rooms. There they now are, seven in the family, two seriously ill with diphtheria. Comment is needless. Near by in full view of this cottage stands the hospital with 12 occupied, and 25 vacant beds. If there were no other resource, there is no sufficient reason why one wing of this hospital could not be completely isolated, and used for these cases. This is done in neighboring cities, and has always been so done. Dozens of cases have been continuously so dealt with in the Toronto General Hospital, without any contagion arising, until last year they became so numerous that a separate hospital was required. But there are other resources, and it is not necessary to devote even any unoccupied portion of the present hospital to diphtheria and scarlet fever. It is only necessary to carry out the purpose of the founder of the hospital, the late John H. Stratford, and erect the small hospital annex proposed by him, approved of by the whole hospital staff of ten physicians, and which was about to be erected at the time of his lamentable death.

Of the self denying and self sacrificing labors of the president and board of governors, and especially of the president, for everything which relates to the welfare of the hospital I am deeply sensible, and I trust that the imperative needs of the case will induce them to take up this matter without hesitation, and carry it out according to the views of the medical staff repeatedly expressed. The City of Brantford may thus, at a trifling annual

expense be fully equipped to deal with the serious question of contagious diseases, and may be spared the large and unnecessary expense of establishing and maintaining an entirely separate hospital, for which there would usually be no use during a large portion of the year.

Small pox Hospital.—According to the directions of this board, the hospital building at Mount Hope has been thoroughly repaired, and at a very moderate cost. In the event of cholera or small-pox occurring, we would be able to put in some furniture, and have a portion ready for use in two or three hours. It would be well to have a large number of trees planted on the north and east aspects of the building, and I recommend that the use of the land should be granted to some one who would do that work, and keep an eye to the building.

Water Supply.—Between 400 and 500 additional water services have been supplied during the year, and it is expected that by the end of this year nearly 1,300 services will be in operation. There has been no necessity to enforce the abandonment of wells, first, because public opinion is setting in strongly against the use of well water, derived as it is from the rain fall percolating through filthy back yards, etc. ; and, second, because very many persons, who hugged the delusion that their particular wells were supplied by springs derived from some remote and immaculate source were promptly undeluded by having their wells dried up by the newly constructed adjacent sewer.

The prospect is now good for the general abandonment of well water for domestic uses, and more gradually the utilization of our unsurpassed sewerage system, which is a necessary complement to the free use of city water. These results should be anticipated with the greatest satisfaction, having regard to family convenience and comfort, and especially to the public health.

Milk Supply.—Exclusive of private supplies there are at present 24 dairies having 342 cows supplying the city, and the daily supply from them is 2,238 quarts.

The dairies have all been thoroughly inspected by the sanitary inspector, and all found to be in a clean and wholesome condition.

Starch refuse has been practically abandoned as a food. Hay, grain, chop, etc., being chiefly used. Three general tests of milk have been made during the year with the Babcock tester. The average percentage of butter fat was in April 3.78, in July 3 69, and in November 3.90, the whole average being 3.79 as compared with 3.60 last year, and 3.20 in 1889. The quality is now to be regarded as excellent, and it is important that the efforts to keep it so should not be relaxed.

Sanitary Inspection.—Besides the records of milk inspections and examinations above referred to, the sanitary inspection books show that 915 house to house inspections were made during the year, 407 complaints of nuisances, etc., were attended to. The two slaughter houses were inspected and were found in good condition. 290 pits were emptied by order of the inspector, and of these 125 were filled up ; 38 special notices to abate nuisances were served. About 60 notices to make sewer connection were served, 40 of which have already been made according to notice, 40 samples of water were tested, 21 of which were found bad. 23 police court prosecutions were made. In 12 cases there were convictions, the fines amounting to $65.50 ; 11 cases were discharged on the nuisance being abated. 167 notices of contagious diseases were sent to the public schools, besides a large number to the other schools and Sabbath schools, and to the Free Library.

The disinfection of a considerable number of books which have been quarantined at the Free Library will complete the work of the year.

EGERTON GRIFFIN, M.D.,
Medical Health Officer.

GUELPH.

Medical Health Officer's Report.

During the year, in all 188 deaths were registered, which gives for our population of 11,000, a mortality rate of 17.09 per thousand.

The sanitary inspector's books show that 184 cases of diphtheria were reported, of which 37 proved fatal; 15 cases of scarlet fever, without a death, and 8 cases of typhoid fever with one death. The epidemic of diphtheria, which we had last fall and winter was practically stamped out in May, and I am pleased to be able to state that the last death from any form of contagious disease, occurred early in June.

It is the opinion of many good authorities on the subject that scarlet fever, measles, small-pox and diphtheria are propagated by contagion from the sick, directly or indirectly to those exposed. Indirectly, we frequently have it arising from school rooms and public places of assembly being infected by emanations from the sick. Public conveyances, and even the clothes of those who come in contact may carry the contagion. The convalescent may also infect for a considerable period. Another important feature, especially in reference to diphtheria, is that a person may actually have the disease without knowing it. The usual false membrane, and other signs and symptoms, on inspection may not be observable, yet such person is highly dangerous to others. It is therefore evident that early recognition, followed promptly by isolation and thorough disinfection, are factors of great importance, in combating an epidemic. These measures, on the whole, have been carefully carried out in this city.

A word about cholera. Many believe it quite probable that the scourge will reach Ontario next summer, and should their fears prove to be well founded, special measures will be necessary on our part.

At the last meeting of the Board of Health, we ordered as a precaution, an extra cleaning of yards, and other places where garbage tends to collect. We also took steps which will enable us, without delay, to deal with an outbreak, should it unfortunately appear, in our limits.

In order to improve our position to cope with the disease, especially since we have, as yet, no efficient system for the removal of garbage, I recommended the citizens to burn in the kitchen stove all vegetable and other combustible refuse, for by so doing the spring will find us with a greatly reduced amount of decomposable matter.

Guelph has good water-works, of which we are justly proud; the general contour of the cite of the city, and the nature of the subsoil, are favorable to natural drainage of storm water; its citizens, as a rule, are in favor of any reasonable scheme to improve its sanitary surroundings; and, what is not to be overlooked, the Sanitary Inspector is capable, energetic and untiring in the discharge of the duties connected with the office he has so long held.

But how can our sanitarians work to advantage, when we have no provisions for the disposal of night soil and garbage, other than the condemned and barbarous privy-pit for the former, and an annual removal for the latter? To add to our danger, about half a million gallons of water are daily pumped into the city, and there is no drain worthy of name to carry it away.

It has long been conceded by persons competent to judge, that a system of water-works necessitates a system of drainage, and *vice versa*, else the sanitation is imperfect. It is useless to deny the fact, that the time has come when we must either have sewers or else run considerable risk from the ever increasing contamination of soil and air due to our primitive method.

My predecessor, the late Dr. Keating, again and again called attention to this important subject, but our city officials failed to profit by his advice. Brantford, Berlin, Brockville, and other Conadian cities and towns of our size have successfully overcome the difficulty by constructing works on the new or separate sewerage system. This system is very effective, and costs much less than the combined method of drainage. Our position renders it very applicable for the requirements of the city. The authorities would

merely require to construct sewer trunks, build automatic flushing tanks, provide a sewage farm, and a few other details, then the remainder could be done under a local improvement by-law. Persons in a position to estimate put the cost to construct it here at less than $70,000. When we consider the need and importance of the work in regard to the welfare of the city, the cost is certainly moderate. Further delay, in my opinion, is hazardous, not only to our sanitation but also to our prosperity. It is to be hoped that the members of the city council may see their way clear to employ an engineer to make the preliminary surveys and estimates; submit these to a sanitary engineer of experience for approval, and when the spring opens have everything ready to proceed with the work.

It is also advisable that the city health by-law should be so amended, as to make it compulsory for citizens within certain limits, to have their garbage removed regularly once or twice a week by a person appointed, and under the control of the Board of Health.

With sewerage and proper disposal of garbage, Guelph will speedily stand second to no other place in the Dominion, in a sanitary respect.

The Inspector's report to me bears its own testimony, and amply proves that his office is no sinecure.

The fact that little or no friction resulted, speaks much for his ability and tact.

H. HOWITT, M.D.,
Medical Health Officer.

HAMILTON.

Medical Health Officer's Report.

It gives me pleasure to be able to report, during the past year, ending the 31st October the health statistics of the city (the annexed territory being included), show our sanitary condition to have been satisfactory. The total mortality of our citizens was 670, being 11 less than the previous year without the annex. Although our population must now be fully 50,000, I will take the figures of the last Dominion census which did not include the recent addition. The population then was 48,908. This number places our death-rate at 13.69 per 1,000.

On referring to the death rate of the past few years, I find that in both years of 1876 and 1877 it reached over 21 per 1,000, and that it has gradually decreased to the present low rate. Will sanitary work get any credit for this? If not, why not?

I think that a lower rate will yet be accomplished, when existing nuisances become things of the past.

Contagious diseases with resulting deaths have not been excessive, although there has been an increase over last year. The combined cases of scarlatina, typhoid and diphtheria number 234 with 14 deaths. Cases of measles, whooping cough, mumps and chickenpox have been reported to the number of 88.

Children who have recently had contagious diseases, are allowed to mingle too soon with the healthier. This is a great mistake which has proved occasionally to be a very serious one, and should be guarded against, in all schools, and other public or private gatherings. A fatal case of diphtheria has been lately reported. The disease appeared to have been contracted from a child who had it in Detriot, but was brought on a visit here after supposed convalescence. This child kissed the child who died. Was this merely a coincidence or did the visitor still retain the germs of infection? Cases of this kind, however doubtful they may seem, should cause parents to be more careful in keeping their children away from the recently sick, and also prohibit that prevailing habit of kissing so frequent amongst children. Many children now attend the public schools who have never been vaccinated. This should not be permitted. I do not see any very urgent necessity for *enforcing* vaccination upon those who have once been successfully operated on, but all others should—the principle that an ounce of prevention is better than a pound of cure is a very sound one to adopt. It is said that the disease is now spreading in England, and it is not impossible that a case might be landed in our midst, unless every passenger vessel was subjected to the extreme inconvenience of a prolonged quarantine.

The recent special inspection of the city has been productive in causing a larger number of pestiferous privy pits than usual, to undergo the process of cleansing. The removal of their contents to make room for a fresh supply may prove a convenience, but it does not quite accord with that degree of perfection required for healthy sanitation. Some careless people use those pits as receptacles for refuse (which should have been placed in the scavenger barrels), rendering them particularly obnoxious. Your Inspector should have special instructions to deal with such places at once, by causing them to be cleaned out immediately and filled in with clean earth forever. Not being fully versed in municipal legislative powers, I may possibly err regarding the feasibility of what seems to me practicable, but in order to stimulate (if that is possible) a more rapid extinction of privy pits, I would suggest the propriety of placing a tax upon all such where the sewers are convenient for use, and also that water for flushing one water-closet in each private dwelling house in the city, should be granted free, so that the exchange of the pit for the closet would be in the interest of both landlord and tenant.

On a previous occasion I alluded to the difficulty persons had in getting sewers, where that accommodation was needed. The obstruction still prevails, and the annual sewer appropriation has never been sufficient for the requirements of the city. Sewers are now wanted in many places, and the outlet of all sewage should be diverted from entering the bay at any point west of Ferguson avenue, this can very easily be effected from James street north to that point, and connections made with James street sewer, could carry off most of the sewage north of the G. T. R. and east of Bay street, if money was supplied for that purpose. Your city engineer could overcome other difficulties, if any. It is to be hoped that no impediment will occur, to delay the construction of sewers in the south-west part of the city where thay have been much needed.

In selecting the boundaries for cutting ice during the coming season I would respectfully ask your board to make no distinction in the quality of the ice to be cut, but that it shall be fit for domestic use. Ice that has hitherto been used for cooling purposes, should not be tolerated any longer. I cannot conclude without observing that two blocks of ice were cut from our bay last March and taken to Toronto, by whose authority I don't know. This must have been the ice selected to compare with the Toronto Bay ice. The report appeared in the *Empire* and was published as emanating from an official of the Toronto Board of Health, otherwise I would not notice it. The blocks must, undoubtedly, have been cut from the mouth or close vicinity of a sewer, for none other from our bay could compare with the standard of Toronto Bay ice. We have an analyst now residing in our city who is fully competent to analyse ice, it might be advisable in drawing the boundaries to have the ice tested by him, taken from different points of the bay.

The following tables illustrate the decrease in the death-rate during the year; show that infant mortality was also less than formerly, and also the location and number of infectious diseases.

Table of death rates.

Year 1881-92.	Totals.	Males.	Females.	Monthly rate per 1,000.
November	50	23	27	1.02
December	61	29	32	1.26
January	86	41	45	1.75
February	67	37	30	1.36
March	59	30	29	1.02
April	41	18	23	.84
May	41	21	20	.83
June	44	24	20	.89
July	50	23	27	1.02
August	76	41	35	1.54
September	54	25	29	1.01
October	41	21	20	.83
Totals	670	333	337	

Deaths 670, population 48,908, rate per 1,000, 13.69.

Appended to this is a table showing that there were 602 interments in Hamilton cemetery, 165 in the Roman Catholic cemetery, and 77 sent to foreign burial grounds. Here is another interesting table :

Deaths by Wards.

——	1	2	3	4	5	6	7	Totals by months.
November	8	4	8	11	4	6	9	50
December	4	9	10	7	7	14	10	61
January	8	12	10	13	7	20	16	86
February	5	8	13	6	4	16	15	67
March	4	4	15	5	7	8	16	59
April	2	3	13	5	3	9	6	41
May	2	5	5	6	6	10	7	41
June	2	10	3	7	1	13	8	44
July	2	2	12	9	5	7	13	50
August	7	11	11	13	11	13	10	76
September	7	5	12	12	4	9	5	54
October	5	6	4	5	7	8	6	41
Totals by wards	56	79	116	99	66	133	121	670
Totals by wards in 1891	56	54	113	116	86	109	147	681

Of the deaths credited to ward 2, 9 died in St. Joseph's Hospital.

Of the deaths credited to ward 6, 8 died in the House of Refuge.

Of the deaths credited to ward 7, 37 died in the City Hospital.

Deaths south of King 251, as 223 previous year.

Deaths north of King 419, as 458 previous year.

By comparing this year with last year it will be noticed that the redistribution of wards has affected the mortality somewhat in most of the wards, Nos. 2, 4 and 6 being increased, while No. 7 is decreased.

Report of Contagious Diseases by Months and by Wards.

Contagious diseases by months.	Scarlatina.		Diphtheria.		Typhoid fever.		Total cases reported.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
November	16	1	2	..	8	1	26
December	7	..	1	1	5	1	13
January	5	..	3	..	2	1	10
February	10	..	2	1	1	1	13
March	11	1	..	..	4	3	15
April	4	..	..	..	4	..	8
May	12	..	3	..	3	..	18
June	3	..	..	..	5	.	8
July	6	..	1	.	2	..	9
August	11	..	1	.	15	1	27
September	20	..	2	1	21	1	43
October	20	..	5	..	9	..	44
Totals	135	2	20	3	79	10	254

By Wards.

Contagious diseases by wards.	Scarlatina.		Diphtheria		Typhoid fever.		Total cases reported.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Ward No. 1	13	1	3	..	6	..	22
Ward No. 2	10	..	.	..	14	1	24
Ward No. 3	33	..	1	..	15	5	49
Ward No. 4	18	..	7	2	17	..	32
Ward No. 5	13	..	3	..	14	1	30
Ward No. 6	14	..	3	..	9	1	26
Ward No. 7	34	1	3	1	14	2	51
Totals	135	2	20	3	79	10	234

Dr. Ryall continues : This year (compared with the previous) shows a very satisfactory decrease in the mortality of children. The total under five years of age was 195, against 237, being 42 less. Of the former number 139 were under 1 year, against 179 the year previous, showing a decrease of 40. The principal causes of death of those under 1 year were : Premature births 23, infantile debility 8, convulsions 13 and diarrhœal diseases 33. One might reasonably expect a larger mortality from diarrhœal cases, owing to the excessively warm weather encountered during the months of July and August.

Accidents seem to be a prolific cause of death, 18 having occurred during the year. One citizen was shot in the country and another was killed by a trolley car in Toronto, while 16 others occurred in the city from various causes. Five suicides were also reported, one of which took place at Guelph. I presume that all those accidents, as well as other minor calamities and eventualities, are attributed mainly to the "will of God."

Of the non-resident burials 29 were from the United States, of which a few were suicides ; 12 were from Toronto ; 23 from the township of Barton, which number includes 17 from the Lunatic Asylum. The remainder were from other different parts of the Dominion, including one from Winnipeg, and one from British Columbia. The large number of non-residents buried annually in our cemeteries will soon help to fill up all available space.

The non-residents dying in the city, came here for treatment and died in the hospitals.

J. RYALL, M. D.,
Medical Health Officer.

KINGSTON.

Medical Health Officer's Report.

I beg leave to lay before you my Annual Report on the sanitary condition of our city, also the Health Reports and those concerning the work performed by the Health Department during the year 1892.

These documents show that many desirable improvements in the sanitary system have been made, and that several much needed requirements have been introduced with most satisfactory results.

The sanitary condition of any municipality is indicated by the number of deaths from zymotic or preventable diseases. I regret very much, however, to state that I am unable to furnish these figures owing to the Dominion Government having ceased to collect such statistics. Those procured by the Provincial Government are incomplete and render it impossible for me to furnish accurate local returns.

Schools.—The overcrowding of our public schools will soon be remedied by the erection of Victoria school, a new eight-room building situated on Union street (between Alfred and Frontenac streets), at a total cost of $20,000 with accommodation for at least 400 pupils. The site is all that could be desired, being on high ground and affording a beautiful view of the lake to the west. The rooms are large and airy, the seats comfortable and substantial, and there is abundance of space in the play grounds. The school board aiming at providing the most perfect system of heating and ventilation decided to place the Smead-Dowd system in the building. It is hoped that the system will afford perfect sanitation and leave no room for complaint in this respect.

Infectious Diseases.—We have had during the year, a very great number of cases of zymotic diseases reported, of which measles prevailed to an alarming extent in the month of February, necessitating the closing of one of the public schools. Fortunately the disease was of a very mild type, only two deaths resulting therefrom. Typhoid fever made its appearance in the spring and has prevailed to a limited extent—the deaths being comparatively few—lastly, scarlet fever made its appearance in the month of November but of such a mild character that it did not necessitate the assistance or advice of medical interference to any extent.

——	Typhoid.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.
	Cases.	Cases.	Cases.	Cases.	Cases.
January	6	2	8	28	..
February	10	1	2	48	2
March	16	..	1	2	..
April	18	1	..	2	..
May	10	..	..	..	..
June	6	..	3	..	..
July	3	1	1	..	..
August	1	..	..	..	..
September	1	..	..	..	..
October	..	..	4	..	..
November	1	1	20	1	..
December	4	..	21	..	..
Totals	76	6	60	81	2

Ambulance.—Kingston has now a well equipped private conveyance for the removal of persons suffering from contagious or infectious diseases. Its services can be procured at all hours at a reasonable cost, and in cases of inability to pay, it can be procured free of charge on application of the Local Board of Health. It is both unwise and dangerous to have patients, suffering with those diseases, conveyed in cabs, or other vehicles used for the conveyance of the travelling public.

Scavenger Work.—The removal of garbage this year has been more systematically attended to and regularly removed than ever before, yet it would require the constant supervision of the Sanitary Inspector to compel some citizens to have their garbage and other refuse matter attended to, thereby preventing its being dangerous to the public health. However, it is a source of satisfaction to us to be able to report that all orders, both verbal and written, given by this Board for the abatement of such nuisances have been generally complied with.

There were issued during the year 656 permits for the emptying of privy vaults, from which was taken 30,894 cubic feet of night-soil. Dead animals to the number of 109 were removed from the public streets and harbor, all of which were buried in trenches upon the nuisance ground outside of the city limits.

Dry Earth Closets.—There are now in use 288 dry earth closets throughout the city which are giving better satisfaction than former years. To make this system more complete, I would recommend that galvanized iron buckets be used, instead of the wooden boxes or tubs, which are apt to become foul from the soakage taking place. A sample of galvanized iron bucket can be seen in the office of the Sanitary Inspector.

Slaughter Houses.—These have been inspected regularly during the year (from May to November) and found to have been kept clean, and without complaint. At the same time I would recommend that all slaughter houses be removed outside of the city, or else one common abattoir be erected by the corporation for the use of all butchers within our limits.

House to House Inspection.—The police constables made a house to house inspection of all premises in the city, and from their reports go to show that the city has been in a better sanitary condition, than for many years past. The following is a summary of the reports: Number of yards inspected, 1,435, 1293 of these were upon first inspection reported clean, and 142 as dirty; number of privy vaults inspected, 1371, 1218 of these were upon first inspection reported clean and 152 as dirty.

Cellars.—There were twenty-four cellars and drains which were complained of as being out of repair and unsanitary. Upon investigation some were found without proper ventilation. Some required to be drained, others having no traps to the drains and others required to be cleaned out on account of deposits from defective drainage and decaying wood. Most of the above premises are situated in the line of Princess street. I am very happy to state that in all these cases the remedy applied has been gratifying to me and satisfactory to the occupants.

Water Supply.—I am glad to note that 4,721 feet of new mains have been laid during the year, making a total of twenty-three and a half miles of mains in use up to the present time That 150 service pipes have been added during 1892, making a total of 2,128 services in use to date.

Sewers.—There have been constructed under the Local Improvement Act during the year, 1,617 feet of twelve inch, and 765 feet of nine inch tile sewers, at a cost of $3,818.90. There still exists in the city 35,400 feet of old stone drains, which I hope will be removed in the near future and tile sewers constructed instead, as those drains are a menace to the public health. I am further pleased to be able to state that the council in its wisdom has seen fit to have two by-laws passed, which I consider necessary in the interest of the health of the people, one being the regulation of the construction of branch drains which must now be done under the supervision of the city engineer, the other by-law making it imperative on the parts of all owners of occupied property to provide sinks on their premises for the carrying off of waste water, slops, etc.

Ice Supply.—All ice used for household purposes must be obtained outside the limits laid down by the Local Board of Health, which secures to the consumer as pure ice as can be obtained from the lake, and only ice for cooling purposes can be taken within the limits after a permit has been granted by the Inspector.

SAMUEL H. FEE, M.D.,
Medical Health Officer.

LONDON.

Medical Health Officer's Report.

GENTLEMEN,—I beg to submit my annual report upon the sanitary condition and health of the city for the year ending November 15. The Federal Government having ceased the collection of mortuary statistics, the death-rate for the year cannot be accurately ascertained. Nevertheless, I have every reason to believe that the rate of mortality will not exceed that of last year, which was the lowest in the Dominion.

One hundred and thirty-seven cases of infectious diseases were reported by physicians, divided as follows: Measles 2, diphtheria 30, typhoid fever 33, scarlet fever 76. Of these 10 of diphtheria, 3 of scarlet fever, 22 of typhoid and 2 cases of measles were sent to the City Hospital. The mortality from all was light.

One hundred and forty-one citizens' complaints were received and attended to, compared with 103 last year. Twenty-five samples of well water were examined—16 of these wells were found to be contaminated, and caused to be closed, the other 9 were good; 16 cesspools and privy pits were closed, 9 persons compelled to connect their premises with public sewers, and 4 houses were condemned, being unfit for habitation.

Two-hundred and fifty-eight samples of milk were examined during the year, and 61 herds and dairies visited twice, making 122 visits. In general the herds were in fair condition and clean, and some exceedingly good and well kept. The quantity of milk supplied the city by vendors was, with a few exceptions, good, only 4 samples falling below 3.25 of butter fat. Semi-annual reports of these inspections, together with the quality of the milk, are made to the Board and published in the daily newspapers of the city for the information of the people.

Notwithstanding the apathy, and, in many instances, opposition, manifested by some of London's citizens with reference to keeping their premises clean, the work accomplished by the Sanitary Inspector, Mr. Bell, and the assistant, Mr. Lutman, has been well and thoroughly done, as will be seen from the following table:

Premises inspected	10,463
Premises reported not clean	126
Closets reported not clean	1,967
Cesspools reported not clean	29

The work of cleaning is still going on, and before the end of November the city will be in a good sanitary condition—indeed, better than it has ever been before.

Analysis of samples of ice, and also of water taken from the places where ice is cut for the supply of the city, have been made by the public analyst, Dr. Harrison, a report of which I have already laid before the Board.

In view of a possible visitation of cholera in the spring, the action of the Board in bonding a lot upon which an inexpensive building can be quickly erected when needed, to be used as a cholera or small-pox hospital, was wise.

Decomposing organic matter being one of the most fruitful sources of diphtheria and some of the fevers, a sub-committee appointed by the Board divided the city into four districts for the collection of garbage, and, calling for tenders for its removal, twice a week, from the 15th of May to the 15th of September, and once a week during the remainder of the year. From some misconception of the amount of the work to be done, or an inordinate desire to become suddenly rich, the tenders were surprisingly high. There is no doubt that the difficulty of disposing of this garbage, and the possibility of having to transport it long distances, has much to do in making the tenders so largely in excess of the actual cost of removal. This shows the necessity, not only upon economical grounds but as a conservator of the public health, of the city having a crematory.

Were it not for the long-distance hauling, the same quantity of garbage could readily be removed at one-half the cost. A crematory large enough for the city, could be built for about $1,200, and need not be kept burning more than two days in the week. If necessary, filth of any description could also be destroyed in this way. By reducing the cost of garbage removal, a crematory would probably pay for itself in one or two years.

Upon the recommendation of the Board, the city council ordered a sewer to be laid down on the Wortley road, from Bruce street north the Stanley street. This was very much needed in order to prevent the further pollution of the hillside and flats, and it is hoped that nothing will occur to prevent the completion of the work, before the opening of spring.

The disposal of the city's sewage, other than pouring it into the river, still remains an unsettled question. At the request of last year's Board, Mr. Willis Chipman, sanitary engineer of Toronto, made plans and furnished estimates of the probable cost of a complete system of sewerage for the city, which, as was recommended by me in a former report to the Board, included an intercepting trunk sewer along the left bank of the river, crossing the south branch near York street bridge by means of a syphon, thence to the low lands below the cove, and there destroyed by oxidization on the land. Connecting with this trunk sewer, the separate system of sewerage could be laid down in or along Carling's Creek, which at present drains about two-fifths of the city, and let storm water take care of itself. The disposal of sewage by irrigation is the best method known to modern scientists, and sooner or later the city council will have to grapple with this unpleasant question, and adopt this or some other approved system, other than allowing the sewage to pollute the river.

T. V. HUTCHINSON, M.D.,
Medical Health Officer.

OTTAWA.

Medical Health Officer's Report.

It is satisfactory to note, in the first place, that during the last year the public health has been generally good.

The total mortality for the period comprised in this report, excluding still births, was 983 deaths from all causes, and out of these 502 deaths are reported as of children under five years of age.

This, estimating our present population at 46,500, would give us a death-rate of 21.13 per thousand—a fair shewing.

Owing to the fact that since January, 1892, the Federal Government has given up the collection of mortuary statistics, and due also to the fact that the law providing for the registration of deaths has been, up to recently, almost entirely ignored, and even now is but indifferently complied with, I am unable to give any statistics shewing with any accuracy the general causes of death.

In May certificates the cause of death is not given at all, and in many more it is given by incompetent persons, and consequently unreliable.

This state of things is very much to be regretted, and, I fear, will never be righted unless by legislative enactment compelling cemetery authorities to exact in all cases before burial a certificate of the cause of death, signed by a physician.

With the exception of measles, which, to an unusual degree, contributed to swell our death-roll (an epidemic of this disease having prevailed throughout the city during the last of the winter and spring months), there has been for the last year a decrease in the mortality rate from infectious diseases, as shewn in table here appended.

As regards such forms of these diseases more particularly needing isolation, I with pleasure, record the fact that the law requiring notification of the health authorities is, as a rule, complied with, whilst the public more willingly co-operate with this department in carrying out such measures as the safety of the community demand. The hospitals for the isolation and care of such cases have, beyond doubt, done good service in the past as first constituted; but, owing to the fact that we have always in our midst sporadic cases of different types of infectious diseases which, for the good of all, must be there isolated, they are not now altogether adequate to meet present requirements. Public interest demands that the usefulness of such institutions and appointments should be such as to inspire the utmost confidence to the physician, and the public generally; and it is to be hoped that the council of 1893 will realize their responsibilities in this matter, and see their way clear in giving the hospital authorities such assistance as will enable them to carry out the improvements suggested by me in a report to your Board made on the 26th of July last. The number of cases treated in these hospitals during the year as well as the number of infectious diseases reported to this department, are shown in tables here appended.

As regards typhoid fever and measles, the number of cases reported at the Health Office, I know, does not represent the number of such cases that occurred in the city during the last twelve months, and that, consequently, the figures given here are unreliable and misleading.

The just fears of the possible invasion of this country by Asiatic cholera, an epidemic of which prevailed during last summer and fall in certain European countries, caused the sanitary authorities on this side to prepare for all emergencies against this justly dreaded pestilence. With a view, therefore, of wakening up the public to a proper sense of the pending danger, extra help was given this department, and a house-to-house inspection was made, resulting in a general cleaning up of premises, which, I have no doubt, was largely conducive to the public well being.

That the past year was marked by satisfactory progress in sanitary improvements is evidenced by the fact that, besides the completing of certain number of drains recommended by the Board of Health of the previous year, 26 sanitary subsidiary drains, recommended by your Board during the year, are, with a few exceptions, now made or in process of completion in the different parts of the city. In connection with this important question of drainage, I regret that the plan recommended by your Board, which would have brought about the connection of the McLeod street drain with the main sewer, and the removal of the nuisance caused by the discharge of the contents of said drain into Baxter's Creek at Elgin street, has failed, with little prospects of relief in the near future in any other way.

For some years past numerous have been the complaints of the offensiveness of the sewer air escaping from the manholes and gratings along the course of the main sewer. With a view of satisfying the complainants and to modify if possible the present mode of ventilation of said sewer during the summer, the services of an expert sanitary engineer were engaged, who, after due enquiry, was to report and recommend whatever improvements were deemed necessary. This report has not yet been presented.

During the past year I have tested 81 samples of milk with the most satisfactory results in the great majority of cases. The supervision exercised by the Health Department over this indispensable article of food has been productive of most beneficial results, and I am confident that the milk supply of Ottawa is to-day equal, if not superior, to that of any city in Canada.

The system inaugurated in 1891 for the removal and disposal of household refuse has been better appreciated during the past twelve months, than during the previous year, and no doubt will yet much improve in effectiveness as its advantages are better understood by the general public. As it is, though not all that could be desired, it has proved a great boon to a very large portion of the community.

The ambulance service during the year has been satisfactorily done by the contractor in charge of both ambulances, who has generally been prompt and prudent in the execution of his work.

For all details of the work of this department specially under the supervision and control of the Sanitary Inspector, I beg to refer you to that gentleman's comprehensive report for the past year.

In conclusion, I desire to express my entire satisfaction with the assistance I received from the Health Office staff in the discharge of the duties devolving upon this department.

Table shewing the death-rate per thousand per annum from infectious diseases during the past two years :—

Time.	Population (estimated).	Diphtheria.	Croup.	Scarlatina.	Measles.	Whooping Cough.	Typhoid Fever.	Total deaths.	Rate per 1,000.
1891	45,000	30	14	24	6	7	9	90	1.99
1892	46,500	15	7	4	16	13	13	68	1.46

Table shewing number of cases of infectious diseases treated in hospitals during the year ending 31st October, 1892 :—

Diseases.	Number admitted.	Number discharged.	Number died.	Remarks.
Diphtheria	84	76	8	
Scarlet fever	37	35	2	
Measles	17	16	1	
Totals	138	127	11	

Table shewing number of cases of infectious diseases reported at the Health Office during the year ending 31st October, 1892 :—

——	Diphtheria.	Scarlet fever.	Measles.	Typhoid fever.	Total.	Remarks.
1892	50	81	40	17	188	

Records of the By-Ward Foundling Institution, Bethlehem, for the past year :—

November 1st, 1891	Infants remaining in institution	12	
	Admitted during the year	198	
	Total	210	210
November 1st, 1892	Infants placed during last year	56	
	Died " "	140	
	Remaining in institution at the end of year	14	
	Total	210	210

A. ROBILLARD, M.D.,
Medical Health Officer.

Report of Sanitary Inspector.

To the Chairman and Members of the Board of Health :

GENTLEMEN,—In submitting this report, it gives me pleasure to say that this year shows that vast improvements in drainage facilities have been inaugurated, and in the majority of cases completed. In other respects progress is not so marked ; still, however, the work done will bear favorable comparison with the preceding years.

Complaints.—Table No. 1 shows that a large number of complaints have been sent in during the past year, but in most cases the grievances have been remedied by notice to offenders. In nine (9) cases, however, proceedings in Court were necessary, which, it is to be hoped, may have a salutary effect. The total number of complaints (2,057) as shown in this table, calling for an investigation, gives an average of about six (6) complaints to each working day throughout the year.

In dealing with these complaints from whatever source, a uniform course is pursued. Having ascertained whom is the responsible party, whether the owner, agent or occupant, he is notified of the nature of the evil found to exist, and it is learned whether he will abate the nuisance.

When there is unnecessary delay in attending to the matter, he receives a Statutory notice stating the nature of the complaint and what is required to be done within a specified time, or the law will be enforced. The next step, when necessary, is to issue a summons to appear before the Police Court for infraction of the "Public Health Act." (See Table No. 2, written notices.)

Privy Vaults.—I would again call your attention to the constant source of danger which continually menaces the population in the privy-vault. This antiquated system should be rooted out.

House-to-House Visitation.—374 house-to house inspections have been made by the Assistant-Inspectors in the intervals of their other duties, and as often as the exigencies of other work would permit. In this way, many nuisances have been discovered which might otherwise have escaped detection.

Removal of Garbage.—The present system for the removal of garbage, although an improvement on the past, is not an entire success. The contractor for this work is so surrounded with difficulties that it is almost at a loss he is carrying out his contract. He cannot collect moneys, where he is refused payment, without recourse to the Division Court, and for sums varying from 20 cents to $1. This is an expensive process, and the time lost in carrying out such prosecutions, is worth more than the sums involved. Again, he has not the entire control of the removal of garbage. Outsiders are permitted to take contracts to cleanse banks, hotels and other large public buildings, and in many cases shops and private residences. His contract (to be worth anything) should be so framed as to shut out all others, excepting those having horses of their own, and willing, under a permit from the Health Officer, to remove their own refuse.

In conclusion, I have much pleasure in testifying to the satisfactory manner in which the Assistant-Inspectors have performed their duties during the past year.

Table No. 1—Classification of nuisances reported to the Department during the year :—

Description of nuisance.	By whom reported.					
	Sanitary Staff.	Tenants.	Neighbors	Owners.	Others.	Total.
Accumulations of manure on premises, etc	193	....	7	....	3	203
do do on vacant lots, streets, etc	4	.....	4	.....	1	9
do of stagnant water	24	.....	17	1	2	44
Cellars flooded and otherwise polluted	49	133	16	3	3	204
Drain choked	10	11	1	3	.....	25
do of defective construction	62	31	3	.....	4	100
do box	31	9	.....	.....	.....	40
do stone	2	.	....	....	.....	2
do none	92	30	4	3	.....	129
Dwelling houses unfit for habitation	5	1	.....	.....	1	7
do dirty and unwholesome	8	....	3	2	.....	13
do sewer gas escaping into	41	50	1	6	.....	97
do illuminating gas escaping into	2	5	34	1	.....	9
Foul yards and premises	616	....	15	9	.....	659
Privies of defective construction	138	91	.....	.....	4	248
do none	16	3	17	....	.....	19
Pigs kept too near dwellings	12	.....	2	.....	1	30
Sinks untrapped	6	18	.....	.....	....	26
do otherwise defective	17	4	.....	....	1	22
do none	2	4	2	.....	.....	6
Stables too near dwelling	9	.....	.....	.....	....	11
Soil-pipes unventilated	19	2	.....	.....	.....	21
Waste-pipes of defective construction	57	14	.....	...	2	73
Water-closets do	23	19	....	.....	.....	42
Water supply defective	1	4	.....	....	.....	5
Miscellaneous	7	.....	6	.....	....	13
Totals	1,446	429	132	28	22	2,057

Table No. 2—Statutory notices issued in connection with the foregoing Table :—

Time.	Notices.				Total.
	To tenants and others.	To proprietors.	Written.	Verbal.	
November, 1891	41	71	38	74	112
December "	27	20	23	24	47
January, 1892	21	24	22	26	45
February, "	24	6	19	11	30
March, "	27	40	24	43	67
April, "	24	251	35	240	275
May, "	68	129	56	141	197
June, "	63	122	65	120	185
July, "	31	146	35	142	177
August, "	87	154	74	167	241
September, "	79	146	93	132	225
October, "	65	37	53	49	102
Total	557	1,146	537	1,166	1,703

Table No. 3—Location of Nuisances as shewn in Table 1.

Street.	No. of Nuisances.	Street.	No. of Nuisances.
Albert	43	Isabella	1
Alexander	3	James	3
Anderson	3	Kent	27
Ann	6	Keefer	2
Augusta	12	King	25
Arthur	1	Lisgar	37
Bank	33	LeBreton	5
Bay	13	Rideau	36
Bell	30	Rose	5
Besserer	29	Redpath	3
Bridge	34	St. Andrew	42
Bolton	17	St. Joseph	26
Botelier	2	St. Patrick	46
Broad	13	Sparks	46
Britannia	10	Stewart	7
Balsam	4	Sophia	1
Cambridge	16	Sussex	27
Catheart	12	Somerset	15
Cartier	1	Slater	16
Cedar	6	Sherwood	14
Church	26	Spruce	1
Concession	10	Lewis	4
Cobourgh	12	Lochiel	1
Canal	3	Lloyd	4
Cumberland	39	Lyon	6
Clarence	77	Lorne Ave	23
Cooper	13	McGee	2
Creighton	11	McLaren	6
Charlotte	1	McDonald	2
Parliament	1	McDougal	2
Portland Ave	1	McLeod	7
Peter	2	McKay	20
Primrose Ave	3	McTaggart	5
Percy	9	Maria	40
Pinard	1	Murray	26
Pine	7	Maple	4
Pine, N.E	1	Metcalfe	9
Preston	13	Middle	12
Poplar	4	Mosgrove	2
Perkins Ave	2	Martineau	4
Queen	34	Munroe	2
Queen West	6	Market Square	1
Rochester	22	Market By Ward	5
Chapel	2	Nelson	31
Currier	1	Nepean	30
College Ave	2	Nicholas	17
Charles	1	Notre Dame	16
Cliff	1	Ottawa	35
Daly Ave	10	Oregon	5
Dalhousie	55	O'Connor	10
Division	33	Stanley Ave	4
Duke	19	Theodore	6
Elgin	11	Turner	4
Eccles	3	Victoria	6
Elm	5	Water	29
Ellen	6	Waller	11
Friel	9	Waverley	2
Frank	6	Wellington	73
Florence	6	Wilbrod	8
Flora	3	Willow	2
Gloucester	54	York	19
George	4	Other places	5
Grove	4		
Head	2		
Hill	5	Total	1,703

Table No. 4—Privy Vaults emptied during the year and the Revenue derived therefrom.

Time	Upper Town.		Lower Town.		Total.	
	No. of Privies.	Amount.	No. of Privies.	Amount.	No. of Privies.	Amount.
1891.		$ c.		$ c.		$ c.
November	151	211 41	161	196 45	312	407 86
December	134	179 15	241	313 50	375	492 55
1892.						
January	178	265 61	261	331 87	439	597 48
February	238	328 90	270	384 60	508	713 50
March	278	378 10	211	303 40	489	681 50
April	202	280 90	180	249 60	382	530 50
May	165	243 05	67	102 40	232	345 45
June	98	137 58	58	58 30	156	195 88
July	66	106 30	27	36 00	93	142 30
August	55	69 10	34	45 70	89	114 80
September	123	206 00	100	113 25	223	319 25
October	150	228 90	152	200 90	302	429 80
Total	1,838	2,634 90	1,762	2,335 97	3,600	4,970 87
Average						1 38

All of which is respectfully submitted,

GEO. McNEILL,
Sanitary Inspector.

STRATFORD.

Medical Health Officer's Report.

The total number of deaths for the year is 109, showing, on a basis of 10,000 population, a death-rate of 10.9 per thousand.

The number of deaths from contagious diseases was remarkably small.

Thirty-two cases of typhoid fever were reported, with 2 deaths.

Of scarlet fever 43 cases were reported with 3 deaths.

Diphtheria—8 cases were reported with 2 deaths. By prompt attention to isolation and disinfection, the secases were confined to three houses where they first appeared. The cause in the first case was due to exposure of clothing infected some months before; in the second case, the disease was brought here from Owen Sound; and in the 3rd was due to defective drainage.

Measles have been more prevalent than any other contagious disease. As in many cases of this disease, no physician was employed, it is impossible to arrive at an estimate of the number of cases. Only one death from this disease has been reported.

Milk supply.—95 samples of milk have been examined, and the quality in nearly all found good. With our present milk-testing apparatus an accurate analysis cannot be arrived at. I would strongly recommend the purchase of a "Babcock" tester by the city.

Water supply.—Over 120 samples of water from wells in the city were examined and of these, I found 60 per cent. bad. In many cases the bad quality of the water was no doubt due to the amount of "surface" water which washed into wells during the hot weather in early summer.

While the majority of householders showed great willingness to put and keep their premises in sanitary condition, a few required to be constantly looked after by the Sanitary Inspector. I regret to say, that some of the worst offenders in this direction, are to be found among the business men of the city, who persist in polluting the lanes and yards in rear of their places of business. Many cellars under business blocks were also found to be badly drained, and containing an amount of garbage and stagnant water. In all cases these were ordered cleaned at once.

As to present sanitary requirements of the city, I would recommend :—

1. More frequent flushing of sewers and open drains.

2. An improved scavenger system.

3. Carrying out as soon as possible, the construction of a proper system of sewers.

4. Furnishing the city with a pure water supply.

5. Cleaning and straightening the bed of the Avon, from the dam to the western boundary of the corporation, in order to facilitate drainage and prevent accumulation of filth therein.

With these improvements, I feel satisfied that Stratford would continue in the future as she has in the past, to be one of the healthiest cities on the continent.

D. D. ELLIS, M.D.,
Medical Health Officer.

ST. CATHARINES.

Chairman's Report.

It is a pleasing duty to state, that the city has enjoyed its usual good health.

A statement from the City Clerk, showing the number of deaths from all sources is hereto annexed, being 172.

To arrive at the city death-rate from ordinary diseases, I deduct the following deaths as per City Clerk's statement :—Still-born 18, accident 3, burned 1, old age 11, drowned 3, making in all 36 deaths not chargeable to any disease, leaving 136 deaths during the year from various diseases as per clerk's statement, showing a death rate of 13.6-10 per 1,000.

Deaths from typhoid, 4 ; from diphtheria, 1.

The privy vault, as usual, is the most difficult matter we have to deal with. It is to be hoped dry earth closets will gradually come into general use. I am afraid our scavengers are not doing the work as efficiently as it should be done, and closets are not being properly disinfected, which is as necessary as it is to have them cleaned.

The flushing of sewers is considered of very great importance, and it is to be hoped some arrangement can be made to have this done at stated intervals. With our very efficient water-works, it should be an easy matter to accomplish, and without paying the exorbitant sum named by the Water-Works Commission of $10 for each flushing. At that rate, to do the work properly, it would cost $500 per year.

It is to be regretted, that the city council did not act upon the recommendation of the Board *re* appointing of an assistant inspector for a short season. If this had been done a very large amount of work would have been performed, and the city placed in a wholesome sanitary condition.

It is to be hoped the council will, in future, act upon the advice of gentlemen whom it appoints to look after the health of the city, as they have nothing but the best interests of the city at heart.

SAML. G. DOLSON,
Chairman.

ST. THOMAS.

Medical Health Officer's Report.

During the year 1892 the number of deaths from all causes was 92. Deaths from preventable diseases have been—from whooping cough, 2 ; typhoid fever, 4 ; scarlet fever, 3 ; and diphtheria, 2.

The card system has been the means of preventing the spread of zymotic diseases to a considerable extent.

The epidemic of scarlet fever has been prevalent for the entire year. I noticed that the disease would be suspended for some time, and then in certain school sections it would break out again, showing that the necessary preventative of thorough cleanliness and disinfection had not been adopted. The spread of the disease was undoubtedly due to the children attending school, in clothes worn by them during the time of the disease or its convalescence.

As the present system, from carelessness or want of knowledge, is ineffectual, it is important that the city should establish a proper place for the thorough cleansing and disinfection of all clothing and bedding worn or used by persons or families during the time of fever.

The number of houses placarded during the year of 1892 was—for scarlet fever, 104; for diphtheria, 19; for measels 4, which had expended its force during the previous year.

We have now over eight miles of brick and tile sewers in good working order.

Previously to the sewerage system there were quite a great many deaths from typhoid fever. Since that time all contagious diseases have been of a milder type, and typhoid fever, since the construction of this sanitary work, has gradually disappeared.

There are now over 400 closet connections with the sewer. It is the desire of the Board of Health that all persons living in the vicinity of sewers should use them. It is the intention of the Board of Health to urge on the council the necessity of passing a by-law to compel every person so situated to do away with privy pits and have water closets connected with the sewer.

Owing to a mistake made in the construction of our main sewer it will be necessary to put down another trunk sewer about a mile in length for the purpose of draining the entire city.

We have an abundant supply of excellent water, filtered by means of the Hyatt system of filters, although not equal to spring water that might have been conveyed to the city in iron and tile pipes at a less expense, such as Woodstock and London have availed themselves; yet the supply is abundant, and is forced through twenty miles of pipes to all parts of the city, enabling us to flush every sewer.

It is the intention of the Board to advise the council to cause all public lavatories to have sewer connections.

We have erected a building in one of the most picturesque parts of the city, away from all residences, for the purpose of isolating diseases such as small-pox or cholera should they make their appearance.

We are gradually doing away with our mud roads and substituting good gravel and broken stone, so that during every rain storm they may be cleaned.

The population of St. Thomas is 10,812; number of deaths from all causes for year 92, giving us a death-rate of .85.

WM. C. VAN BUSKIRK. M.D.,
Medical Health Officer.

WINDSOR.

Medical Health Officer's Report.

Scarlet fever and diphtheria have been very prevalent during the past year. Measles and whooping cough have also been epidemic, but with the exception of diphtheria all have been mild and the death-rate low.

As the Dominion Government has withdrawn the subsidy for collecting vital statistics I cannot give the usual mortuary summary.

The following is from the records of the Health Officer: Scarlet fever, 112 cases, 4 deaths; diphtheria, 81 cases, 19 deaths, the mortality of the former being 3½ per cent. and the latter 23½ per cent.

Scarlet fever has been more difficult to isolate this year on account of its mild from, many cases escaping notice until exfoliation took place.

Diphtheria as usual has done its deadly work, mostly in houses with damp cellars, and where unhealthy conditions existed under and around the house. Through the vigilance of the Inspector these conditions have been greatly improved and in another year will have almost disappeared.

The usual cleaning up was done in May. The Inspector's books show that 569 loads of refuse and garbage were removed at a cost of $294.07 ; that officer also reports 785 privy vaults were cleaned and the contents amounting to 3,648 barrels removed

Fifty sewer connections have been made during the year and as many vaults filled up, besides a large number of new connections have been made on the streets where the connections were put in when sewers were constructed.

Cholera Precautions.—Application to the city council for special grant of $500 met with a prompt compliance, and a general cleaning-up circular was issued, although at that time the city was never before so clean, yet when everybody set to work to dig out corners hitherto overlooked, a vast amount of fertile material for the development of disease germs was carted away and its bed rendered harmless by the liberal use of disinfectants.

Arrangements were made with the three railways to keep a car near the station should the disease develop on the trains.

An ambulance was kept in readiness to remove the cases promptly and tents were bespoken which could have been erected on a few hours' notice. Nurses were also bespoken, and as far as necessary the situation was anticipated.

The State of Michigan proclaimed a quarantine against all passengers landing in the St. Lawrence and against those coming from New York as well. The city of Detroit did the same, and sent inspectors to examine passengers on their arrival here, and the consequence was that trains of immigrants were delayed for days in the railway yards. These people were left without food except such as the railway authorities and the charitably inclined furnished, and they drank water full of sewage along the docks or out of the ditches when the cars were sent to the rear of the city. For a time this treatment was only accorded to third-class passengers but later first-class passengers coming by steamers carrying no steerage passengers were subjected to the same treatment and they were ordered into quarantine for 20 days by these inspectors, with an air of authority, which, owing to their ignorance of the ways of the country and their defenceless condition, they accepted it as a culprit receives his sentence from a judge.

This inspection is still going on at Windsor, Point Edward and the Soo, and unless something can be done to prevent, it is liable to continue for years to come. It is almost certain to develop epidemics in Windsor which otherwise would never have reached us, and inasmuch as Michigan has made no preparation as to quarantine grounds, or appliances for the disinfection the effect is neither scientific, protective, humane or intelligent. In fact it savors of the same spirit which actuated the inhabitants of Fire Island where defenceless passengers were denied the necessities of life and threatened with shot guns. If the Michigan Board of Health expects the co-operation from Ontario to protect the State of Michigan from disease they will never accomplish that end by erecting a breeding bed for it in Windsor, and their inspectors must cease to practice their insufferable methods. This is a clear case where the inspector has been to Windsor a greater nuisance and a greater source of danger than the disease they sought to combat.

Water.—I am happy to be able to report progress on the question of a purer water supply which has been the subject of much solicitation on the part of the inhabitants and also the theme of much acrimonious correspondence. Analysis after analysis made last year and this has so conclusively demonstrated the presence of sewage in our water, that the water commissioners engaged Mr. Chipman, C.E., to examine and report on the subject.

This report has not yet been sent in but I have no doubt it will result in giving us a purer supply, at a very moderate outlay of money. The water may still be muddy at times, but it will be minus the contribution of the Walkerville sewers.

Sewerage.—The Michigan Central Railway Company continue to pump the sewage of Windsor as a water supply to their employees and passengers despite the notification that the Board will proceed against them. The fact that much sickness has prevailed among their employees this year and a notably high proportion of typhoid fever has occurred among them would seem to warrant this Board in issuing an injunction restraining the company from using this water.

On the 13th September a Committee of this Board inspected a number of livery and boarding stables and reported a shocking state of things. After receiving the report and passing a resolution to deal with them the Inspector served them with notices, but with one exception these notices were ignored. The same conditions as these exist and the health of those living in the vicinity is endangered by these nuisances.

I have made a number of milk inspections during the year, and found nearly every sample up to the ordinary standard.

The crowded condition of our schools, and the reopening of an old building which had been condemned demands increased accommodation immediatly.

The need of a contagious disease hospital has been fully demonstrated this year, and the council appointed a committee to confer with this Board on the matter. I have been in daily expectation of receiving plans from the Provincial Board of Health but they have not reached me. Besides the hospital a disinfecting apparatus is absolutely necessary in order to destroy contagion in clothing, as the present methods are very unsatisfactory.

Mr. Grieves, the Inspector, has again done excellent work and his report shows not only a vast amount of cleaning up, but owing to his careful oversight the work was done very cheaply.

JOHN COVENTRY,
Medical Health Officer.

TOWNS.

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, Scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night soil.
Barrie	The provisions of the Health Act have not been conformed with by some, and faulty sanitation exists in residential parts of town.	All wells in certain sections of town were ordered to be filled up.	Isolation and disinfection adopted in these diseases. M. H. O. points out the responsibility that rests upon all Local Boards in preparing to resist cholera should it make its appearance in the country.	D.—Several cases. T.—A few cases. S. F.—4.	.....	.....	All privies were ordered to be abolished in certain parts of town. Regular removal of contents of earth closets has been effected.
Bowmanville .	M. H. O. remarks that in view of visitation of cholera, citizens showed individually endeavor to keep town in a good sanitary condition.	Drinking water used believed to be of good character.	....	D.—6. T.—3. S. F.—4.	.....	.....	Only two places reported in an unsanitary condition, etc., nuisances were removed.
Bracebridge .	The Board was energetic in looking after anything detrimental to public health.	....	The spread of diphtheria largely due to want of proper precautions in first cases.	D.—No. of cases. T.–1. S. F.—A few cases.			
Brampton	A set of rules prepared by chairman published *re* disinfection, etc.	....	....	D.—1. S. F.–Cases.	....	.....	Garbage properly disposed of.
Brockville....	The town has been put in good sanitary condition. M. H. O. recommends strict regulations as to cutting of ice.	Water supply has had the serious consideration of Board. The public wells have been closed, being sources of danger to community.	An isolation hospital has been erected and ready for use at a moment's notice. Typoid traceable to well water.	D.—1. T.—A number of cases. S. F.—A number of cases.	Many streets without sewers, and many houses on sewered streets not connected.	The keeping of pigs prohibited within certain limits of municipality. Slaughter-houses inspected and milk regularly tested.	A large number of pits cleaned, and all garbage properly disposed of.

Chatham	An additional sanitary inspector was appointed and a thorough cleaning up of the town took place. Schools received attention.	The water supply reported by M. H. O. to be excellent.	Isolation, placarding and disinfection used to prevent spread of infectious diseases. The council has secured land for erection of an isolation hospital in view of a possible outbreak of cholera.	D.—17. T.—8. S. F.—25.	A more perfect sewer system about to be constructed. Council asked to pass a plumbing by-law and appoint an inspector of plumbing.		
Cobourg.....	M. H. O. recommends that every means should be taken to put the town in a good sanitary condition against the possible invasion of cholera.	Drinking water found in some cases to be impure.	Strict attention paid to placarding isolation and disinfection in infectious diseases.	D.—13. T.—28. S. F.—2.	A number of sewers and ditches were constructed.	Slaughter-houses found in a satisfactory condition on inspection.	
Collingwood..	.....	Water supplied pronounced good.	.....	D.—3. S. F.—A few cases.	No regular system of drainage.	.. ..	Council passed a by-law prohibiting privy pits in central portion of town.
Dresden.....	A careful inspection of town made by M. H. O. Two complaints came before Board.	....	....	T.—3. S. F.—1.	....	....	Privy pits found to be a fruitful source of disease and their abolishment recommended.
Dundas	House to house inspection made as well as inspection of water closets, barns, etc. One house destroyed because of its filthy condition by order of council.	Abandonment of well water shows greater freedom from diseases attributable to contaminated water.	Placarding adopted in infectious diseases. The Board purchased copperas and distributed it freely to householders.	T.—1. S. F.—1.	.....	.....	Water closets were cleaned and all garbage properly disposed of.
Fort William.	.....	Water supply is from Kaministiquia river and fairly good.	....	T.—3.	.....	Slaughter-houses some distance from any dwelling or street are kept clean.	The nuisance ground is one and one-half miles from the town, and one-half miles from any dwelling is well adapted for the purpose.

TOWNS.—*Continued.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night-soil.
Galt	House to house inspection made, as well as all schools, factories, etc.	A number of wells inspected, where water found bad orders given to close well.	.....	.....	.....	.....	The removal of nuisances properly attended to.
Ingersoll	All milk vendors compelled to register, and inspection of dairies and testing of milk was made. The schools were inspected and the well-water at central school condemned, the well was closed.	The sources of the water supply should have better protection from cattle, and removal of all fallen wood along supply stream recommended.	.....	D.—1. T.—1.	.....	Slaughter-houses have been well kept, and the management of a pork-packing establishment has exercised much care in keeping the surroundings in a sanitary condition The keeping of hogs in thickly settled parts of town should be prohibited at all times.	The removal of night-soil to dumping pit out of town limits efficiently performed under supervision of Board. All engaged in removal required to register and pay license fee. It is recommended by Board that privy pits be abolished and dry-earth closets substituted.
Kincardine ..	A large number of yards inspected. All garbage removed where found.	Some wells closed...	A severe epidemic of diphtheria extending over five months.	D.—70. T.—2.	.....	.....	Board intends to substitute dry earth closets for privy pits where possible.
Lindsay.....	Some cattle affected with actinomycosis slaughtered and meat offered for sale.	An efficient system of water-works constructed.	Precaution taken to prevent spread of infectious diseases.	D.—6. T.—1. S. F.—12.	The construction of a system of sewerage under way....	Careful inspection of slaughter-houses and dairies made.	The cleaning out and disinfecting of privies neglected in many cases.
Meaford	Householders were notified to put their premises in a sanitary condition.	.....	A fine was imposed on one person for exposing clothing, etc., from a house in which diphtheria existed.	.....	.....	.....	Council was urged to do away with privy pits.

Milton	The Board desires to acknowledge the assistance given by the physicians of the town during the year.	....	Placarding and other necessary precautions taken to prevent spread of infectious diseases.	D.—A few cases. S. F.—2.			
Napanee	The council backward in seconding the efforts of Board of Health to put town in a good sanitary condition, the recommendations of Board treated with greatest indifference by it.	Water supply of town generally bad.	Free from infectious diseases.	T.—Some cases.	....	.....	An isolated plot of ground secured for deposits of night-soil and garbage.
Newmarket ..	A thorough inspection of town was made, some complaints made to the Board were dealt with.	... .	Isolation and disinfection used to prevent spread of infectious diseases.	D.—26. T.—2. S. F.—2.	....	....	Many privy vaults so constructed as to be difficult to clean Board recommends that the trouble be dealt with by the council.
Niagara	House to house inspection made, and all existing evils ordered to be removed.	Recommended that all open wells be filled in. Water from water-works excellent in quality	.....	.....	All open drains have been cleaned. It is ordered that all cesspools should be cleaned.	Slaughter-houses to be removed outside of town limits.	It is recommended that all privy vaults be filled in and dry earth closets substituted.
North Toronto	Good sanitary condition of town attributed to the efforts of the sanitary inspector. Children in certain district prohibited from attending school owing to diphtheria.	A system of water-works established and water supplied found to be good.	Diphtheria most prevalent in part of town adjacent to night-soil dumps, to abatement of nuisance was attributed abatement of disease which followed. Isolation of much value in limiting spread of disease.	D.—45. T.—5. S. F.—3.	....	Slaughter houses reported well kept.	Board asked Township Board to prohibit night-soil being deposited within half mile of town limits. Some filthy closets were ordered to be cleaned and disinfected.
Oakville.	.....	.....	Diphtheria very rare.	S. F.—2			

TOWNS.—*Continued.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night-soil.
Owen Sound..	Milk supplied found on analysis to have a fair average. M. H. O. regrets that as clean a bill of health cannot be reported as in two former years.	.....	Spread of diphtheria due to children attending school from affected houses. Placarding, disinfection, etc., found necessary to check spread of disease.	D.—75. T.—6. S. F.—17.	About one-half mile of sewer pipe laid during the year.	.....	M. H. O. remarks that one of their greatest difficulties is the irregular manner in which night-soil is disposed of; he recommends the regular removal of all garbage.
Paris	A thorough inspection of yards, etc., made by sanitary inspector. The M. H. O. recommends that the milk sold be tested.	Analysis of water shows it to be first-class.	The attendance at school of children in whose homes scarlet fever existed had much to do with spread of disease.	D.—1. T.—2. S. F.—24.	A number of sewers have been constructed during the year.	No animals slaughtered within town limits. Pig-pens kept properly. Complaints made against G. T. R. shipping yards.	Some difficulty experienced by householders in getting night-soil removed, an organized plan for removal of it and garbage recommended.
Parry Sound..	On inspection many of the schools were found poorly ventilated, the lighting and heating also defective in some.	A system of works that is giving great satisfaction has been constructed.	Free from infectious diseases.	....	....	.....	The sinking of any more privy pits was forbidden, and dry earth closets ordered instead.
Pembroke	House to house inspection with notice to householders to remove all garbage forthwith.	Water supply bad in six places. Privies too near wells. An abundant water supply.	Precautions taken in infectious diseases.	D.—2. T.—19. S. F.—2	Many cellars wet and undrained. A perfect system of sewerage.	Only one slaughter-house within town limits, precautions taken to keep it in a passable condition.	Nuisances in the form of manure heaps, privies, etc., abated. Some dry-earth closets in use.
Perth	Inspector has inspected streets, yards, etc	....	Free from infectious diseases.	... .	Very little drainage exists, much is required.	.....	Manure from cow byres properly disposed.

Peterboro'....	M. H. O. recommends that every precaution should be taken to prevent cholera should it appear in the country.	Water-works system giving satisfaction.	Precautions taken to prevent spread of these diseases.	T.—6. D.—1	A system of sewerage contemplated.	No complaints made *re* slaughter-houses. A pork packing establishment declared a nuisance and abated.	Garbage properly removed under an organized system.
Petrolia	.....	A system of water-works contemplated.	Placarding and isolation used to prevent spread of infectious diseases.	T.—2. S. F.—Cases.	.....	.....	Garbage, etc., removed under direction of inspector.
Picton	M. H. O. recommends that vaccination so much neglected should be more generally enforced.	All doubtful wells should be closed. Ice supply regulated by Board.	Only two isolated cases of infectious diseases.	.....	.....	.....	The M. H. O. states that the abolition of privy pits should be insisted on, and suitable ground provided for deposits of night-soil.
Port Arthur..	.....	.....	Every place which was infected efficiently and thoroughly disinfected.	T.—1. S. F.—2.			
Port Hope....	Ice from Beamish Pond inspected and pronounced pure. Town inspected.						
Sandwich	In view of an advent of cholera, council passed a by-law so as to secure better sanitation.	No night-soil to be deposited within 50 feet of any well.	Isolation, etc., adopted, in infectious diseases.	D.—A few cases.	.....	.....	Regulations forced *re* cleaning of privy vaults before 1st of May in each year. Immediate disinfection after cleaning. Regular removal of all garbage.
Seaforth	A thorough cleansing of all back yards was made, which had the effect of preventing sickness.	.....	Comparatively free from infectious diseases.	T.—A few cases.	.....	.....	Some difficulty found in getting a deposit ground for garbage, etc.
Simcoe	M. H. O. recommends a house to house inspection in the spring.	.....	Precautions taken to prevent spread of these diseases.	D.—5. S. F.—A few cases.	M. H. O. recommends that more drainage be constructed.	.....	Some complaints *re* odors from a canning factory. M. H. O. urges that all privy pits be done away with.

TOWNS.—*Concluded.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night-soil.
Strathroy	Much attention was given to sanitary condition of town, every possible measure for abating nuisances was adopted.	....	Diphtheria mentioned as being of a malignant type.	D.—5. T.—Cases. S. F.—Cases.	.....	Slaughter-houses on inspection found generally in good condition. Some pig-pens found to be a nuisance.	Night-soil deposits complained of by persons living in vicinity of deposit trenches. Board urged to purchase suitable grounds for night-soil deposits.
Tilsonburg ...	Sanitary condition of town satisfactory.	....	Prompt measures were taken to prevent spread of these diseases.	T.—A few cases. S. F.— "			
Trenton	Majority of the people pay little attention to orders of Board of Health. The cleanliness of the streets should be better looked after.	.....	Energetic measures adopted to prevent spread of diphtheria. M. H. O. urges that the town be put in a good sanitary condition in case cholera should appear.	D.—20. T.—A few cases.	....	....	Four hundred privy pits found on inspection in a filthy condition. M. H. O. thinks that if proper steps are taken much can be done towards abolishing privy pits. A scavenger should be appointed to look after regular removal of night-soil and all garbage.
Walkerton ...	Health of community in a satisfactory condition.	.....	.....	D.—A few cases. S. F.— " T.— "	The drainage of the town into the Saugeen river causing some trouble.		
Walkerville ..	House to house inspection made in spring of year, as well as when cholera threatened to reach the country.	.....	Diphtheria spread because of want of notification in first cases. Isolation enforced to prevent spread of the disease.	D.—25. S. F.—14.	.....	....	The lanes were regularly cleaned and all refuse removed.

West Toronto Junction ..	Dairymens' premises under supervision of Board.	M. H. O. reports a splendid system of water supply.	Placarding and exclusion of children from school from houses where infection exists adopted to prevent spread of infectious diseases.	D.—4. T.—2. S. F.—1.	A system of sewerage under construction.	....	Garbage, etc., properly disposed of under direction of sanitary inspector. Also night-soil.
Whitby	Many nuisances inimical to health abated.	....	M. H. O. reports much illness during the year.	D.—10. T.—11. S. F.—6.			
Windsor	Owing to the probable advent of cholera $500.00 was specially granted by council for a thorough cleaning up of town. An ambulance for removal of cholera patients was in readiness should disease appear, as well as tents for reception of them. Milk tested found nearly up to standard.	M. H. O. reports progress on the question of a purer water supply. M. C. Ry. Co'y. has pumped the sewage of Windsor as a water supply to their employees and passengers, causing much typhoid among them, after being notified to desist.	Diphtheria most deadly in houses with damp cellars and where unhealthy conditions existed under and around the house. Through vigilance of inspector these conditions have been greatly improved. M. H. O. remarks that the need of an infectious disease hospital fully demonstrated this year. Also a disinfecting apparatus for clothing, etc.	D.—81. S. F.—112.	Fifty sewer connections were made during the year.	Some livery and boarding stables in a very filthy condition, causing an intolerable nuisance.	Garbage and refuse properly disposed of. Also contents of many privy vaults.
Woodstock ..	Literature relative to sanitary matters distributed. House to house inspection made. An inspection of dairies and their stables was made which will result in much good both to vendor and consumer. A milk tester was purchased.	The number of water services have been increased, and they have been introduced into the schools.	School teachers were requested to allow none to attend school who were exposed to infectious diseases without certificate from physician. An infectious diseases hospital needed.	D.—A few cases. T.— " S. F.—A number of cases.	M. H. O. recommends the grading and draining of lanes in rear of business places, the want of such injurious to health of citizens.	....	Seven hundred dry earth closets in use and fifteen privy pits were closed up. A suitable dumping ground for garbage much needed. M. H. O. recommends that a scavenging department be organized for removal of night-soil and garbage.

VILLAGES.

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night-soil.
Ailsa Craig...	....	.....	Free from infectious diseases.	.....	....	.....	All privy vaults are cleaned out in spring and disinfected.
Allandale.....	Village believed to be in a good sanitary condition.	.....	All causes that were likely to favor typhoid were removed.	T.—2.			
Alvinston	Board not so energetic as in former years.	Wells not properly looked after.	....	D.—A few cases. S. F.—A few cases.	.....	....	Water closets require more attention.
Amherstburg .	House to house inspection twice made during year.	A system of water-works has been constructed.	....	S. F.—2. T.—4.	.....	A piggery nuisance abated after much trouble.	Garbage from Detroit dumped in river above village prevented by heavily fining offender.
Beamsville ..	House to house inspection made, and premises found in a cleanly condition.	....	Placarding notices sent to schools to prevent spread of diphtheria, and diseases confined to first cases.	D.—3.	Three drains found in a bad condition and repaired.		
Beaverton....	Increased efforts of Board has had a marked effect on the public health.	.....	Free from infectious diseases.	....	....	.....	Close attention has been given to the cleaning of water closets and removal of all garbage.
Blyth	Inspector made an inspection of village and caused all premises to be put in a cleanly condition.	.....	....	D.—2. T.—3.	An excellent system of drainage in operation.		

Bolton			Isolation adopted in diphtheria cases.	D.—4.		One slaughter-house nuisance remedied to some extent.	Some deposits of night soil complained of. Some privy pits emptied and disinfected.
Brussels		Danger to wells from privy vaults.	M.H.O. suggests that all infectious cases of diphtheria be reported by physicians.	D.—1. S. F.—6.		Some hog pens and stables too close to public streets.	M. H. O. urges the adoption of the dry earth system of closets, and the abolishment of privy pits.
Burlington	An inspection of all water closets, lanes, etc., made by inspector.			D.—2. T.—1. S. F.—6.		One slaughter-house needed attention.	
Cannington	A thorough cleaning of all streets, yards, etc., under direction of inspector was made.	Water supply from wells generally good.		D.—31. T.—1. S. F.—1.	A system of drainage is contemplated.	Slaughter-houses are rigidly inspected.	Privy vaults have been cleaned yearly and disinfected. Council has passed a by-law abolishing privy pits and substituting earth closets instead.
Chesley	Inspector made careful inspection of village.	Most of the wells were cleaned out.	Free from infectious diseases.				The yards of two parties found in a dirty condition but remedied on notification.
Colborne	General health of community good.		The schools were closed and disinfected for purpose of stamping out diphtheria.	D. — A number of cases.			
Deseronto	One case before Magistrate for non-compliance with order of Board.		Comparatively free from infectious diseases.				Board ordered filling up of all privy pits and substitution of dry earth closet.
Dundalk	Board made inspection of village during the year. Citizens readily respond to work of Board.			D.—A few cases.			

VILLAGES.—*Continued.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses, etc.	Disposal of garbage and night-soil.
Dunnville		Two wells containing impure water were filled up, and many more are suspected.		T.—9. S. F.—5.			Council passed a by-law to abolish privy pits.
Elora	In view of probability of cholera visiting Canada next summer thorough cleanliness is enjoined on all.	The necessity of having all wells cleaned and all surface filth removed is pointed out.	Free from infectious diseases.				Chairman recommends that privy pits be abolished and dry earth system introduced.
Erin	Places requiring attention were thoroughly inspected.		Means were taken to prevent spread of infectious diseases.	D.—4.			
Exeter	All householders notified to put their premises in a cleanly condition.		Comparatively free from infectious diseases.				
Fergus	Regular inspection of yards and outbuildings made.	The wells in many places looked upon with suspicion because of proximity to privy vaults.		D.—1. S. F.—1.			The dry earth closet system strongly recommended, with regular, systematic removal of contents, and abolishing of all privy vaults.
Forest		Wells regularly cleaned.	Precautions taken to prevent spread of infectious diseases.	S. F. cases.			Night-soil properly disposed of.
Hastings	Everything was done to keep village in good sanitary condition.	Public wells were cleaned out.				Hog pens, etc., looked after.	Privy pits were cleaned.
Lakefield	No complaints made during year.		Free from infectious diseases.				Inspector reports everything clean and well kept.

Leamington ..	.....	... .	Comparatively free from these diseases.	....	.....	One pig pen found too near a dwelling.	Nuisances in the form of manure heaps and offal from slaughter-house abated.
Lucan.....	Nuisances promptly abated.	....	Placarding in infectious diseases.				
Markdale.....	M. H. O. draws attention to advisability of erecting cemetery outside of village limits because of dangerous proximity of present one to wells and residences.	.....	M. H. O. points out in view of probability of cholera the necessity of Board being vigilant in sanitary matters.	D.—A number of cases.			
Merritton	A thorough inspection of all premises made by inspector.	.....	.....	D.—1. T.—1.			
Midland.....	M. H. O. draws attention to possible advent of cholera.	....	Through energetic action of Board diphtheria was stopped from spreading.	D.—2. T.—3.			
Millbrook	Sanitary condition of village good.	....	Free from infectious diseases.	....	....	.....	Closets cleaned out under direction of inspector.
Milverton. ...	Inspector has visited all houses and found them clean.	Well water found of good quality with a few exceptions.	Precautions taken to prevent spread of typhoid. M.H.O. suggests that the law be inforced *re* the reporting of all infectious diseases.	T.—2.	.. ..	M. H. O. suggests that pig-pen in connection with a cheese factory be removed without village limits.	
Newboro'.....	Board active in looking after sanitary condition of village.	.....	Free from infectious diseases.				
Newburgh....	House to house inspection made.	....	Free from infectious diseases.	....	....	.....	Garbage, etc., promptly removed.
Newcastle....	House to house inspection made, and unsanitary conditions removed.	Water supply generally good.	Isolation adopted to prevent spread of scarlet fever.	S. F.—7.			

VILLAGES.—*Continued.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, Scarlet fever.	Drainage.	Slaughter houses, etc.	Disposal of garbage and night-soil.
Niagara Falls Village.....	House to house inspection made by sanitary inspector and, except in a few cases, all premises found in satisfactory condition.	.....	Free from infectious diseases.				
Norwood.....	Householders responded promptly to the call of the inspector to put their premises in a cleanly condition	.....	Isolation and disinfection adopted to prevent spread of infectious diseases.	D.—A few cases. T.—1.	.....	Slaughter-houses on inspection found properly kept	M. H. O. suggests that more stringent measures be adopted *re* disposal of refuse.
Oil Springs ..	Several parties fined for neglecting notices of inspector.	.....	Isolation and disinfection adopted in these diseases.	D.- 3. S. F.—1.	.....	.....	All garbage, etc., removed to a dumping ground provided for it.
Ottawa East..	Several meetings of the Board were held.	.....	Free from infectious diseases.	.....	.....	Some complaints *re* pig-pens and slaughter-houses made. Nuisance abated.	Rules adopted for regular cleaning of privy vaults and cesspools.
Paisley.....	Sanitary condition of village satisfactory, and people willing to comply with the Act.	.....	.....	S. F.—?.	.....	.....	One nuisance only reported and remedied.
Pt. Edward...	Notices were given the people in the spring to clean up their premises.	.....	Isolation in infectious diseases.	D.—1. T.—2.	.....	.....	A few nuisances were reported and promptly abated.

Pt. Elgin...	A thorough inspection of all yards, water-closets, cellars, cisterns, etc., made by inspector, and he insisted upon these being kept in a good condition.	All the wells in village were cleaned before June 1st.	Isolation in infectious diseases.	D.—Some cases. T.—Some cases.	.....	.....	Dry earth closets substituted for privy pits and regular removal of contents.
Portsmouth...	House to house inspection made and all yards, cellars, etc., were ordered to be cleaned.	Water supply from wells.	Free from infectious diseases.	....	Some cellars suffer from spring and fall freshets.	....	Privy pits still in use, dry earth closets the exception.
Renfrew.....	Vigorous measures were adopted to ensure cleanliness of all yards, etc. Chairman suggests that as early in year as frost will permit all refuse from streets, yards, etc., should be removed in case of appearance of cholera.	....	Comparatively free from infectious diseases.	....	The flushing of all drains recommended.	.....	Nuisances caused by closets, wash house, etc., were remedied. The regular removal of night-soil and adoption of dry earth closets are recommended.
Southampton.	Sanitary regulations have been well carried out in most cases.	.....	.....	D.—A few cases.	....	.....	Board passed a resolution that all new closets and replacing old ones must be on the dry earth system.
Stirling	Inspector made regular inspections of village.	.....	Free from infectious diseases.	....	....	.....	Garbage properly disposed of.
Stouffville....	Houses and outbuildings carefully inspected.	....	The usual precautions taken to prevent spread.	D.—3.			
Streetsville...	House to house inspection of municipality made. All nuisances complained of abated.	.....	Free from infectious diseases, with exception of one case of typhoid	T.—1.			

VILLAGES.—*Concluded.*

Name of place.	General inspection.	Water supply.	Infectious diseases.	Diphtheria, typhoid, Scarlet fever.	Drainage.	Slaughter-houses, etc	Disposal of garbage and night-soil.
Sutton.....	Inspector made an inspection in spring and fall and urged the necessity of removal of all refuse, etc.	.....	.....	D.—2. T.—1.	Underground drainage suggested to keep cellars dry.		
Teeswater.....	A thorough inspection of village made, and any nuisances abated.	.....	Every precaution taken to prevent spread of infectious diseases.	D.—2. T.—1.			
Thamesville..	Sanitary condition of village good.	.....	.....	T.—2. S. F.—2.			
Thedford.....	.....	.....	M. H. O. thinks the diphtheria due to defective drainage.	D.—11. T.—A few cases.			
Tilbury Centre	.....	All wells were attended to.	Free from infectious diseases.	.....	.....	.....	All closets are looked after.
Tweed.....	Yards, etc., looked after by sanitary inspector.	Wells in danger of contamination from accumulations of refuse.	.....	S. F.—A few cases.	Drainage of some low lands effected.	A pig-pen nuisance in connection with a cheese factory abated.	M. H. O. suggests that the disposal of all refuse be looked after more closely.
Uxbridge.....	Chairman of Board thinks the law should be amended giving council power to abolish privy pits.	Organic matter found in well waters 100 feet away from manure heap or cesspool.	.....	T.—A large number of cases.	.....	.....	Board recommends abolition of privy pits. The digging of new ones prohibited.
Vienna.....	Health of community good. No complaints made to Board.	.....	Free from infectious diseases.				
Waterford...	General health of community good.	.....	M. H. O. has kept close watch on infectious diseases.	S. F.—2.			

Watford.....	Public beginning to realize that cleanliness is the best preventative from disease.	Water supply not likely to be contaminated.	.....	....	Drainage not so good as wished.		
Weston	House to house inspection made and a general cleaning up ordered.	....	Disinfection and isolation used to prevent spread of infectious diseases.	D.—1. T.—4.	.....	A nuisance in the form of bringing in manure by trains is reported.	M.H.O. recommends the passing of a by-law compelling householders to substitute dry earth closets for privy pits.

TOWNSHIPS.

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter houses and pig-pens.
Adelaide.....	Sanitary inspector made two inspections during the year.	.....	....	....	T.—Several cases. S. F.— "		
Albemarle....	Sanitary condition of township satisfactory.	Water supply pure..	.....	Free from infectious diseases.			
Alnwick	Board active in its endeavors to put township in good sanitary condition.	.....	....	Typhoid due to privy attached to house, odors from which permeated every room in the house. Diphtheria thought to be due to pool of stagnant water near house.	D.—1. T.—2.	.....	M.H.O. recommends that all privy pits be thoroughly cleaned and disinfected not later than June, and disinfected at stated intervals thereafter during the summer.
Ameliasburg..	Vaccination neglected.	.....	.....	Disinfection in infectious diseases carried out carefully.	D.—2. T.—2. S. F.—4.		

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever,	Drainage.	Slaughter-houses and pig-pens.
Ancaster	All back yards inspected. Sanitary condition of township good.				T.—5. S. F.—13.		Slaughter houses, etc. inspected, and M. H. O. and inspector saw that they were kept clean.
Ashfield	Only one complaint brought to notice of Board during year.			A close supervision was exercised by the Board throughout the township.		A filthy cesspool nuisance abated by order of inspector.	
Barton	Sanitary condition of township improved since establishments for bone boiling, etc., have been done away with.						Slaughter-houses have been looked after regularly.
Belmont, etc.	M. H. O. and inspector made an inspection of village of Havelock. The people are taking a greater interest in the sanitary regulations of the Board.			Free from infectious diseases.			
Bentinck	The sanitary condition of township has been well looked after by the inspector.				T.—A few cases.		
Blenheim	Board suggests that Rule 7 of Sec. 14, Schedule A, be changed to read "between the first day of April and the first day of November," etc.			A school was closed on account of prevalence of diphtheria; every means taken to prevent spread of disease.			M.H.O. reports that slaughter-house nuisance has been overcome, but the pig-pens have given them trouble.

Brooke.....	.....	Inspector should visit and examine every well used for drinking purposes.	Cheese factories inspected and found in fairly good condition.	Comparatively free from infectious diseases.	T.—A few cases.	....	One slaughter-house nuisance caused trouble.
Bruce.....	M. H. O. reports township in a satisfactory condition so far as preventable diseases are concerned.	.....	.....	Free from diphtheria and scarlet fever.	T.—4.		
Brudenel.....	.....	.....	.....	Every precaution taken to prevent spread of diphtheria.	D.—A number of cases.		
Burford	A thorough inspection of township should be made.	....	....	....	D.—1. T.—1. S. F.—6.		
Caledon.....	A timely visit of M.H.O. prevented the attendance at school of some non-convalescent scarlet fever cases.	An open stream from which drinking water is taken, and to which cows, pigs and geese have access, believed to be the cause of some diphtheria cases.	....	M.H.O. says because of knowledge of sanitary laws, though infectious disease do occur, their speed is checked. Physicians reporting those diseases better than in other years. Also placarding more generally observed. Diphtheria due to decomposing matter in cellars.	D.—22. T.—4. S. F.—11.	....	Two slaughter-house nuisances abated.
Caledonia	The community has on the whole enjoyed very good health.	.....	.....	Assistance was given family in which diphtheria occurred.	D.—2	....	The carcase of a dead horse removed from highway.
Cambridge ...	Members of Board act as inspectors in their respective localities.	.....	.....	Free from infectious diseases.			
Camden.....	M. H. O. reports a general observance of provisions of Health Act on part of the people.	....	....	Every attention given to infectious diseases, such as isolation, etc.			

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Cartwright ...	Certain nuisances complained of were abated.	.....	.....	Isolation and disinfection of premises prevented spread of scarlet fever.	S. F.—1.		
Chaffey	Some houses found in a bad sanitary condition.	Well closed up on account of impurity of water.	.....	Diphtheria very prevalent. An isolation hospital needed in Muskoka. The disease carried from one house to another.			
Charlotteville.	All necessary sanitary arrangements carried out.	.....	.....	In no case did disease spread from house where it originated.	D.—A few cases.		
Chinguacousy	But one complaint to Board during the year.	.....	.....	Comparatively free from infectious diseases, but those that did occur not reported.			
Clarke	.....	.....	.....	Every precaution taken to prevent spread of infectious diseases.	D.—1. T.—1.		
Crowland	Sanitary condition of township fair.	.....	.....	Free from infectious diseases.	.....	Drainage greatly improved during past year.	
Darlington ...	Sanitary condition fair with exception of privies. M. H. O. wishes that something could be devised to do away with these noxious pits in country places.	.....	.....	Owing to isolation and other measures taken diphtheria was confined to first cases, with one exception.	D.—A number of cases. T.—A few cases.	.....	Privies in a filthy condition in many cases and unfit for use.

Dereham	The sanitary condition of township is good.	.....	.....	Diphtheria supposed to be due to impure drinking water.	D.—Few cases. T.—Few cases.		
Dorchester, North	One or two complaints of infringement of Health Act.	.....	.....	Only one case of infectious disease reported.			
Downie	.....	Wells in connection with schools cleaned out.	Accumulations of whey from a cheese factory causing a nuisance.	Free from infectious diseases.	.....	.....	A hog-pen nuisance in connection with a cheese factory reported.
Dumfries, North	Board drew the attention of trustees to the requirements *re* the heating and ventilation of schools. House to house inspection made in villages.	Trustees of schools asked to look to the purity of drinking water supplied.	Inspection of cheese factories was made and the premises of those supplying milk to town.	.....	T.—4. S. F.—A few cases.	.....	Slaughter-houses have been inspected.
Dumfries, South	.....	The wells at the different schools were cleaned out.	....	Typhoid caused by a defective sink in a pantry where milk was kept, and impure water.	T.—5. S. F.—A few cases.		
Dumme	M. H. O. thinks the Board should give the matter of ventilation of schools consideration.	M. H. O. suggests that more attention be given to the drinking water at schools.	.....	Care exercised, such as isolation, etc., prevented diphtheria from spreading. Placarding not generally adopted. Diphtheria due to filthy surroundings.	D.—Several cases. T.— " S.F.— "		
Dysart	A careful inspection of village was made.	Water supply plentiful and good.	.....	Free from infectious diseases.			
Elderslie	Members of Board made inspection of municipality.	.....	.....	Two cases of supposed typhoid arising from unsanitary conditions.			
Elma	Only one nuisance reported to Board, which was abated.	.....	.....	Secretary of B. H. thinks vaccination should be enforced.	D.—A few cases. T.— " S.F.— "	Considerable drainage done, which has had a marked effect on health of community.	

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Emily	Sanitary condition of township good.			Free from infections.			
Enniskillen				Diphtheria supposed to have been spread by school children, the nature of the disease at first being unknown.	D.—Cases. S.F,— "		
Erin	Some buildings found to be in an unsanitary condition, but put to rights by owners after notification.	Some well water found impure.		Some physicians have not complied with provisions of Health Act. Typhoid due to pollution of well and unsanitary condition of premises.	D.—29. T.—5. S.F.—7.		
Esquesing	Members of Local Board met Committee of Provincial Board *re* anthrax at Acton. Inspection of all villages in township made.			Prompt measures taken to prevent the spread of infectious diseases.	D.—Several cases. T.—2.		
Euphrasia	Sanitary condition of township satisfactory.			Isolation and disinfection adopted to prevent spread of diphtheria.	D.—3. T.—1.		
Flamboro', East	No complaints of nuisances during the year.			Some cases of zymotic diseases, but no deaths.			
Gainsboro'	General health of people of township good.			Secretary thinks there should be in every municipality a portable furnace for disinfecting clothing, etc.	S. F.—A few cases		

Garafraxa West	The schools of the township were found in a good sanitary condition, with one exception.			Free from infectious diseases.			
Glamorgan	Municipality in excellent sanitary condition.			Free from infectious diseases.			
Glanford	Inspection of slaughter-houses by inspector.						Slaughter-houses have caused considerable trouble.
Glenelg	Board has diligently looked after sanitary condition of township.			Free from infectious diseases.			
Gloucester	Sanitary condition of township favorable.				D.—13. S.F.—8.		Slaughter-houses are subject to inspection.
Goderich	No complaints made to Board during year.	Water supplied to school good.		Free from infectious diseases.			
Gosfield, North					D.—Some cases.		One slaughter-house nuisance abated.
Greenock	The schools of the township inspected and found in a fair condition.		Chese factory and pig-pens in connection therewith inspected; pig-pens not in a satisfactory condition and pigs ordered to be removed.	Inspector remarks that if infectious diseases were more promptly reported and looked after, the cases would be considerably diminished.	D.—2.		
Grimsby, North	No complaints have been made to Board.			Free from infectious diseases.			
Grimsby, South	Inspector made 65 inspections in Smithville and reports great improvement in sanitary condition of village.			Secretary remarks that the utmost vigilance should be exercised by Local Boards to ward off cholera should it make its appearance in the country.	S.F.—A number of cases.		
Gwillimbury, East				Isolation and disinfection used to prevent spread of diphtheria.	D.—46. T.—1.	Drains looked after.	Slaughter-houses looked after by committee of Board.

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Hamilton	Stringent measures taken by members of Board have kept township in good sanitary condition.	.....	.....	Disinfection, isolation, placarding used to prevent spread of infectious diseases.	D.—1. S.F.—4.	Some cellars found with water in them.	Some dead animals left unburied caused a nuisance.
Harwich	Complaints about sanitary condition of Fargo village made.	Artesian wells rapidly increasing in use.	.....	Isolation adopted to prevent spread of these diseases.	D.—A few cases. T.— " S.F.— "	.....	Slaughter-houses have given but little trouble. The feeding of hogs on offal should be rigidly prohibited.
Hawkesbury, East.....	In a good sanitary condition.	.....	.....	Free from infectious diseases.			
Hawkesbury, West.....	M. H. O. recommends that vaccination be more generally carried out.	.....	.....	Isolation and placarding in infectious diseases.	D.—6. T.—2.		
Hillier	A number of nuisances abated.	.....	.....	Isolation and disinfection used in infectious diseases.	S.F.—8.	.....	A slaughter-house complained of.
Houghton	Sanitary condition of township good.	Wells have been carefully looked after.	.....	Free from infectious diseases.			
Humberstone..	Inspection of township by inspector.	.....	.....	Isolation and disinfection in infectious diseases.	D.—3. S.F.—A few cases.	Considerable drainage of low lands.	
Innisfil.....	M. H. O. draws attention to inadequate sanitary arrangements of school and their outbuildings.	.....	.....	Diphtheria due to causes outside of municipality.	D.—A number of cases.		

Keppel.....	The Board urged, in view of the advent of cholera, to keep township in good sanitary condition.	.....	.....	Free from infectious diseases.	T.—2.	
Kincardine...	Township in a fairly good sanitary condition.	.....	.....	Isolation, placarding, etc., were the precautions taken to prevent spread of typhoid.	T.—Number of cases.	
Kinloss.	....	....	.....	Physicians do not report infectious diseases as they should.	D.—1. T.—1.	
Lindsay	Sanitary condition of township satisfactory.	.....	.....	Free from infectious diseases.		
Lobo	Very few complaints were made during the year; when properly made were attended to.	.....	.....	....	T.—6. S. F.—A few cases.	
Luther, West.	Health of the people good.	....	.....	Free from infectious diseases.	T.—1.	
Logan.....	M. H. O. points out that every Local Board should be thoroughly organized and have an adequate sum of money placed at its disposal to deal promptly and efficiently with cholera should it appear.	M. H. O. recommends looking after the purity of drinking water.	.....	....	T.—Several cases. S. F.—A few cases.	
London	The drawing of night-soil into township caused a nuisance.					
Maidstone....	Some matters arose to which the Board gave special attention.	.....	.....	.....	D.—A few cases. T.— "	Drainage of municipality in an efficient state.

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Mariposa.....	Inspector made 149 house-to-house inspections, and directed the cleaning of yards, privies and wells.	Inspector gave directions to school trustees to have all wells at schools cleaned out.	.....	Local Board views with satisfaction the precautions taken by Provincial Board to stay progress of any epidemics.	D.—6. T.—2.		
Matchedash ..	The schools have been open the whole year.	....	.....	Free from infectious diseases.			
Markham ..	Health of township not in a good condition.	.....	.....	M. H. O does not state what precautions were taken to prevent spread of diseases of this nature.	D.—Many cases. S.F.—Cases.		
McKillop	People found willing to do all in their power to carry out provisions of Health Act.	M. H. O. suggests that wells be carefully looked after.	....	Comparatively free from infectious diseases. M. H. O. urges all householders to prepare against cholera, should it make its appearance.			
Metcalfe.....	Municipality in fair sanitary condition.	.....	.....	... .	S.F.—A few cases.		
Middleton....	The odors from a canning factory complained of.	.....	.....	Precautions were taken to prevent spread of these diseases.	D.—5. S.F.—A number of cases.		
Minto.....	Some complaints were made of defective sanitary arrangements, which were remedied.	M. H. O. urges that each school section be notified to have wells at school thoroughly cleaned.	....	Owing to precautions taken by attending physicians these diseases were confined to first cases.	D.—2. S.F.—2.		

Monaghan, North	Inspector instructed to prosecute any infringement of Health Act.					Proposed system of sewerage of Peterboro' disapproved of, looked upon as dangerous to public health.	Inspection of slaughter-houses made.
Mornington				Precautions taken to prevent spread of infectious diseases.	D.—6. S.F.—A number of cases. T.—1.		
Mulmur	A house in a filthy condition, the cause of much illness, was destroyed.			The public schools are the centres of dissemination for the spread of infectious diseases at times, so remarks the M. H. O. Teachers should be notified to prohibit children attending school exposed to these diseases.	D.—6.		The M. H. O. remarks that the habit of leaving dead animals unburied exists to some extent.
Nassagaweya	General sanitary condition of township fair.			M. H. O. is of opinion that most of the cases, if proper precautions had been taken, of these diseases could have been prevented.	D.—A number of cases. S.F.— "		
Nichol	Board put notice in local newspaper ordering all garbage to be properly disposed of.	All wells were ordered to be cleaned.			S.F.—2.	All stagnant water ordered to be drained away.	
Orford	Board active in sanitary matters.				D.—5. T.—5. S.F.—2.		
Orillia	M. H. O. says that the people are learning to see the necessity of sanitary precautions.			Scarlet fever traceable to infection from another family having the disease. Every precaution taken to prevent spread of disease.	D.—A few cases. S.F.—Cases.		

TOWNSHIPS.—*Continued.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Oro				Isolation in infectious diseases.	D.—Cases. T.— " S.F.— "		
East Oxford		Well water found to contain organic matter.		Diphtheria attributed to filthy condition of cellar and cistern.	D.—1.		
Oxford, North	M. H. O. suggests that active steps be taken in the spring to secure the utmost cleanliness because of threatened invasion of cholera.			M.H.O. draws attention to the management of physicians as in other infectious diseases. Cases should be under control of M. H. O.	S.F.—6.		
Percy	An inspection of the villages in the township made.		Whey in connection with cheese factory allowed to accumulate and become a nuisance.				Some privy vaults found in a filthy condition and ordered to be cleaned.
Pilkington	Board is of the opinion that the School Inspector should be more energetic in looking after condition of schools and their surroundings.	The water at two schools found to be bad.					Privies of some schools not cleaned out for years.
Pittsburgh	Sanitary condition of township on the whole good.			The typhoid due to impure water from wells.	T.—2.	Draining of property adjacent to typhoid cases ordered.	
Puslinch	A regular inspection of school houses made twice.			Free from infectious diseases.			

Raleigh				Complaints were made that children were at school from homes where scarlet fever existed.	T.—Few cases. S.F.— "		
Richmond	The depositing of night-soil from other municipalities stopped.				T.—Several cases.		Several dead animals exposed were buried.
Saugeen		Water on examination at one school found unfit for use.		Isolation and disinfection in these diseases.	D.—A few cases. S.F.—1.		Slaughter-house nuisances abated. M. H. O. suggests that the feeding of hogs in close proximity to slaughter-houses be forbidden.
Scott	All nuisances found were abated.			Every means taken to prevent spread of diphtheria.	D.—5.		
Seneca	M.H.O. reports that vaccination is not as general as it should be.	Some privy pits too close to wells.		Free from infectious diseases.			Privy-pits in several places need cleaning out and to be disinfected.
Somerville	Sanitary condition of township at present satisfactory.			Isolation and disinfection adopted to prevent spread of diphtheria, which was found difficult to stamp out.	D.—A number of cases.		
South Easthope	Trustees of all schools notified to have privies cleaned.	The wells at all schools ordered to be cleaned, and any suspicious water analysed.			T.—Some cases. S.F.—Some cases.		A slaughter-house and tallow-rendering nuisance abated.
Stamford	Water closets of the different schools have been cleaned. Eight nuisances abated.	Water supply from wells found generally of good quality.		Placarding and disinfection adopted in these diseases.	D.—1. S.F.—1.		Slaughter-houses, etc., looked after by inspector and refuse disposed of properly.
St. Vincent		All the wells at schools were ordered to be cleaned.		The clothes of a diphtheria patient were destroyed to prevent spread of disease.		The drainage of low-lying places was ordered.	

TOWNSHIPS.—*Concluded.*

Name of place.	General inspection.	Water supply.	Cheese factories.	Infectious diseases.	Diphtheria, typhoid, scarlet fever.	Drainage.	Slaughter-houses and pig-pens.
Sullivan.....	Inspection of all school houses was made.	.....	.....	Isolation in infectious diseases.	D.—5.		
Sunnidale	M. H. O. advises that privy pits be discontinued and dry earth closets substituted.	Some of the wells are not kept clean in municipality.	....	Free from infectious diseases.	M.H.O. finds school houses imperfectly heated and not enough air space in some for each pupil and desks badly constructed.		
Sydenham....	.....	.. ..	....	Isolation and disinfection in these diseases.	D.—13. T.—1.		
Thorold	M.H.O. recommends a thorough cleaning up in the spring, in view of a possible visitation of cholera.	.....	.....	Precautions taken to prevent spread of infectious diseases.	D.—A few cases. T.— " S.F.— "		
Townsend	.....	.....	....	School closed to prevent spread of scarlet fever.	S.F.—A few cases.		
Turnberry	M. H. O. recommends that walls of cellars be yearly whitewashed with fresh lime. Mortality rate low.	M.H.O. advises that all wells be banked up to prevent entrance of surface water, and that privies be 100 feet from them.	.....	.....	.....	M.H.O. advises that all kitchen slops and waste material be disposed of far away from houses.	
Uxbridge	Some nuisances abated. General health of community good.	....	....	Diphtheria cases promptly looked after by placarding and disinfection.	D.—A few cases.		
Vespra	Nuisances caused by privies in school grounds abated.	....	....	Free from infectious diseases.			

Wainfleet	M. H. O. suggests that owners of cheese factories be compelled to keep surroundings of same clean.	....	Cesspools of whey in connection with a cheese factory causing a nuisance.	Isolation in infectious diseases.	D.—Cases. T.—3. S.F.—Cases.		
Wawanosh, East	General health of community good.	....	.....	Free from infectious diseases.			
Wellesley	School premises and wells have been inspected, and an improvement over last year was observed.	.....	Cheese factories and pig-pens have not been complained of.	A noticeable feature in the diphtheria cases was the number of deaths from heart-failure. Want of proper isolation and disposal of excreta did much to spread the disease.	D.—6.	.. ..	One slaughter-house nuisance was abated.
Whitchurch ..	....	.....	.....	Precautions taken to prevent spread of these diseases.	D.—Some cases. T.— " S.F.— "		
Woolwich	A number of nuisances in the form of filthy yards remedied.	....	....	.....	T.—A number of cases.		
York.....	Free vaccination carried out in public schools in vicinity of East Toronto owing to small-pox in Toronto.	.....	.....	Diphtheria in almost every instance was confined to house in which it originated.	D.—A number of cases.	.....	The dumping of night-soil, which had become a nuisance in the township prohibited.
Yonge, Front.	One complaint to Board which was settled without difficulty.	. ...	.....	Free from infectious diseases.			
Zone	Schools visited twice and thoroughly inspected.	Water supply of school good in general.	.....	....	T.—4 or 4.		

N.B.—Reports from Hagersville, Smith's Falls villages, and from McLean, Beverly, Albion and Rainham make statements that they have had nothing of importance to report.

THE ANNUAL REPORT

FOR

UPPER CANADA COLLEGE

FOR THE

YEAR ENDING JUNE 30TH, 1892.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
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1893.

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THE ANNUAL REPORT

FOR

UPPER CANADA COLLEGE.

I. TRUSTEES' REPORT.

TORONTO, 17TH AUGUST, 1892.

To His Honor Geo. A. Kirkpatrick,

Lieut.-Governor of the Province of Ontario.

May it please your Honor,

The trustees of Upper Canada College hereby submit their annual report for the year ending June 30th, 1892.

CAPITAL EXPENDITURE.

1. Since our last report the Capital Expenditure of Upper Canada College was increased by $8,361.60. This sum being entirely made up of omissions from our previous statement owing to the difficulty in some instances of closing the accounts finally with some of the contractors, and secondly, owing to the delay in settling some minor matters of furniture and equipment required for the College.

BANK ACCOUNTS.

By referring to the Investment Account, hereto annexed, it will be seen that interest and the charges of management on all the investments of the College in the hands of the trustees amounted to $12,054.32 and the interest on the investments to $13,395.13, leaving a balance in favor of the College of $1,340 81. It will also be observed that in addition to the surplus on investments, the College was entitled to a credit of $1,800.00 for the use and occupation of the Bursar's residence. Adding this sum to the surplus income on investments the trustees are able to hand over to the University the sum of $3,140.81 in addition to the debentures and mortgages now on hand.

INCOME AND EXPENDITURE.

On the first day of July, 1891, the Bursar was directed to open a new account for the College showing the entire income from all sources and the expenditure for the ordinary maintenance of the College. It is very gratifying to the trustees to be able to report that for the first time in the history of the College the income from tuition

and residence fees was in excess of the ordinary expenditure. The income for the year amounted to $46,253.20 and the expenditure to $42,227.26, leaving a surplus out of ordinary income of $4,025.94. When it will be remembered that until recently as shewn in our report for last year the entire income of the College from pupils fees as well as its income of about $14,000 a year from its endowments was absorbed in the maintenance of the College, the fact that they are able to show a surplus of $4,000 without touching the endowment shows the very satisfactory financial position to which the College has attained. Had the trustees been less liberal in providing a College to meet the public wants or had they been less liberal in their efforts to equip the College up to the standard of modern requirements it is very doubtful if they would have been able to report an excess of income over expenditure.

RETIREMENT FUND.

Under an Order in Council dated the 8th day of February, 1892, (a copy of which is hereto annexed), the Masters of the College were placed upon the same footing with regard to retiring allowances as the Professors and Lecturers of the University of Toronto. The Bursar has been directed to separate the deductions made under this Order-in-Council from the ordinary income of the College and to place the same in a separate account in the Bank of Commerce. Interest according to the rules of the Bank will be added to this account from time to time so that teachers who retire from the staff will receive the amount to which they are entitled as a retiring allowance. The only charge on the funds of the College in this scheme will be the possible difference between interest received from the Bank and the interest payable to each teacher on the accumulations of his allowance at six per cent.

CAPITAL EXPENDITURE OUT OF INCOME.

By the Act of last session the expenditure on Capital Account out of surplus income is made by Order in Council. Your trustees have approved of the erection of a skating rink for the recreation of the pupils and the erection of a driving house for the shelter of horses and carriages costing together $2,405.38. They have also approved of the construction of a swimming bath at a cost of $566.20, and sundry other improvements amounting to $967.61. These improvements were necessary in the interest of the College and are no charge upon the endowment. They have also to report that all the property, as required by statute, heretofore held in trust for Upper Canada College has been transferred to the trustees of the University, subject to such statutory charges as have been imposed by Parliament in the interests of the College. The details of the expenditure of the year certified to by the Provincial Auditor will also be found herewith.

All of which is respectfully submitted.

Board Room, February 6th, 1893.

S. C. Wood,
Acting Chairman.

Copy of an Order in Council approved by His Honor the Lieutenant Governor, the 8th day of February, A.D. 1892.

Upon the recommendation of the Honorable the Minister of Education the Committee of Council advise that on and after the first day of January, 1892, a fund shall be formed for the retirement of every teacher and officer on the pay list of Upper Canada College, subject to the following regulations :—

The said fund shall be created by the reservation out of any sum which may be assigned as the emolument of the office of percentages, according to the following scale :—

On so much thereof as shall not exceed $1,000, five per cent.

On any excess over $1,000, not beyond $600, or a total emolument of $1,600, seven and one half per cent.

On any excess over $1,600, not beyond $1,000, or a total of $2,600, ten per cent.

The amounts reserved shall in the case of each teacher and officer be credited to a separate account to be opened and headed "Retirement Fund (U.C.C.)" and interest at the rate of six per centum per annum shall be computed on the first day of January and July in each year, on all sums whether of principal or interest, which have been then for six months at the credit of the fund, and such interest shall be credited thereto.

The amounts of principal and interest at the credit of the fund under these regulations shall be invested and reinvested together with the capital endowment funds of the College.

Such amounts shall be deemed charges upon such capital endowment funds; each year's reservation, together with all interest chargeable on the whole fund during each year shall be estimated for and shown as a charge, and provided for, out of the income fund for such year; and the aggregate of principal and interest at the credit of the account at the close of the previous year shall be shown as a charge on the capital endowment funds.

No charge will be made to the teacher or officer for the management, investment and collection of the principal or interest of the fund, and in case in the opinion of the Lieutenant Governor in Council, the normal current rate of interest shall materially advance or decline, so as to render proper an increase or diminution in the rate of interest allowed under the third section, the Lieutenant Governor may from time to time provide for such increase or diminution, to take effect from the date, and during the continuance of such provision.

No teacher or officer shall during his continuance in office have any claim or right to any part of the amount at the credit of the retirement fund.

On the retirement of any teacher or officer, the amount at the credit of the retirement fund shall be payable to him.

On the death of any teacher or officer, in the serviec, the amount at the credit of the retirement fund shall be payable as he may by will direct, or in default of such direction, to his next of kin.

Nothing hereinbefore mentioned shall be held to prejudice any application for a gratuity which any teacher, or other officer may hereafter advance, in view of services rendered prior to the 1st day of January, A.D. 1892.

The Honourable,
The Minister of Education.

Certified,
(Signed), J. Lonsdale Capreol,
Asst. Clerk Executive Council.

Copy of an Order in Council approved by His Honor the Lieutenant Governor, the 14th day of July, A.D. 1892.

Upon the recommendation of the Honourable the Minister of Education, the Committee of Council advise that the sum of fourteen hundred dollars ($1400) be appropriated out of the surplus income of Upper Canada College, for the erection of a skating rink and driving shed, for the use of the College, and that the said money be payable on the order of the Minister of Education.

The Honourable,
The Minister of Education,
Toronto.

Certified,
(Signed), J. Lonsdale Capreol,
Asst. Clerk Executive Council.

Copy of an Order in Council approved by His Honor the Lieutenant Governor, the 24th day of August, A.D. 1892.

The Committee of Council have had under consideration the report of the Honourable the Minister of Education dated 19th August, 1892, wherein he states :—

1. That the surplus income of Upper Canada College for the financial year ending on the 30th June last amounted to $4,021.65.

2. That out of the said surplus income the sum of $1,200 has been appropriated for a skating rink and a further sum of $200 for a driving shed for the use of the College.

Under the provisions of 55 Vic., Cap. 63, section 6, the Minister recommends (1) That a further sum of $550 be appropriated for the construction of a swimming bath and (2) that the sum of $750 be appropriated for partitioning the commercial and music rooms, and increasing the facilities for heating the commercial room.

The Committee concur in the recommendations of the Minister and advise that the same be acted upon.

The Honourable,
The Minister of Education.

Certified,
(Signed), J. Lonsdale Capreol,
Asst. Clerk Executive Council.

Copy of an Order in Council approved by His Honor the Lieutenant Governor, the 20th day of October, 1892.

Referring to the Order in Council of the 24th August, 1892, and upon the recommendation of the Honourable Mr. Harcourt, acting Minister of Education, the Committee of Council advise that a further sum of four hundred dollars ($400) be appropriated out of the surplus income of Upper Canada College to complete the rink now being erected for the said institution.

The Honourable,
The Minister of Education.

Certified,
(Signed), J. Lonsdale Capreol,
Asst. Clerk Executive Council

Copy of an Order in Council approved by His Honor the Lieutenant Governor, the 28th day of December, A.D. 1892.

The Committee of Council have had under consideration the report of the Honourable Mr. Harcourt, Acting Minister of Education, dated the 22nd day of December, instant, wherein he states that Orders in Council were approved by Your Honor on the 14th day of July, 1892, the 24th day of August, 1892, and on the 20th day of October, 1892, appropriating in all three thousand one hundred dollars ($3100) out of the surplus income of Upper Canada College which for the financial year ending 30th June, 1892, amounted to four thousand and twenty-one dollars and sixty-five cents ($4,021.65) for the erection of a skating rink and driving shed, for the construction of a swimming bath and for the partitioning of the commercial and music rooms and increasing the facilities for heating the commercial room ; that up to the present date the sum of three thousand one hundred dollars ($3100) has been paid on account of the said works which have now been fully completed, and it is found that the sum of nine hundred dollars will be needed to complete the payments in full for the said works. The Minister recommends that the said sum of nine hundred dollars to pay for the completion of the said works be appropriated out of the said surplus income of Upper Canada College.

The Committee concur in the recommendation of the Minister and advise that the same be acted upon.

The Honourable,
The Minister of Education.

Certified,
(Signed), J. Lonsdale Capreol,
Asst. Clerk Executive Council.

II. PRINCIPAL'S REPORT.

To His Honor the Honorable George Airey Kirkpatrick, *Lieutenant-Governor of the Province of Ontario, and Visitor, on behalf of the Crown, of Upper Canada College, Toronto.*

May it Please Your Honor :

The Principal of Upper Canada College begs leave to present to your Honor as Visitor on behalf of the Crown, the following Report for the year ending June 30th, 1892.

The work of the school was, on the whole, satisfactory considering the many difficulties to be encountered in moving into the new premises. There were enrolled during the year 353 boys of whom 202 were in residence for the whole or part of the year. The percentage of attendance of the whole school was 80 ; this means that for every 100 boys enrolled there were 80 in attendance every day during the whole school year. The percentage of attendance of boarders was not quite equal to that of day boys. The average percentage of attendance of High Schools and Collegiate Institutes is about 59. The number in the various subjects of study was as follows :

Latin	268
Greek	92
French	343
German	101
Arithmetic	353
Algebra	323
Euclid	242
Trigonometry	12
English Grammar	353
English Composition	353
English Literature	353
Dictation	353
Chemistry	35
Physics	35
Botany	35
Military Drill	254
Music	254
Drawing	263

WHERE THE PUPILS COME FROM.

Counties.	Number.	Counties.	Number.
Brant	4	Peel	3
Bruce	2	Perth	2
Carleton	1	Peterborough	2
Durham	2	Prescott and Russell	7
Essex	3	Renfrew	2
Frontenac	4	Simcoe	10
Glengarry	4	Stormont	5
Grey	3	Victoria	1
Haldimand	1	Waterloo	7
Halton	6	Welland	1
Hastings	2	Wellington	2
Huron	2	Wentworth	12
Kent	1	York	191
Lambton	9	Muskoka	2
Lanark	3	United States	4
Leeds and Grenville	4	Quebec	8
Lincoln	3	Bermuda	1
Middlesex	12	British Columbia	6
Norfolk	1	Manitoba	7
Northumberland	1	Algoma	5
Ontario	2	West Indies	1
Oxford	3	Nova Scotia	1

PUPILS LEAVING.

About 126 boys left during the year ; the following completed the course of study that they pursued :

MATRICULATED AT UNIVERSITY OF TORONTO.

Barr, A. F.
Bruce, H. A.
Eby, W. P.
Edgar, W. W.
Franchot, R.
Gilmour, J. W.
Henry, G. S.
Lander, W. J.
Maclaren, W. C.
MacKay, W. C.
Mullin, J. H.
Moncreiff, G. G.
Noble, J. B.
White, R. W.
White, W. R.
McCracken, T. E.

MATRICULATED AT TRINITY UNIVERSITY.

Beatty, A. A.
Brereton, C. H.
Burk, J. A.
Hargraft, W. H.
Lee, P.
McMurrich, J. B.
Robinson, E. L.
McConnell, J. H. (part.)

MATRICULATED AT McGILL UNIVERSITY.

Graham, S. (part.)
Mill, T. J.

ENTERED ROYAL MILITARY COLLEGE, KINGSTON.

Kirkpatrick, G. S. (ranking 1st.)
Hayne, G. O.
Caldwell, C.
Wilby, A. W.
Hendrie, M.
Cosby, N.
Jones, A. M.

ENTERED ROYAL NAVY.

Denison, Harold E.

UNIVERSITY SCHOLARSHIPS WON AT TORONTO UNIVERSITY.

Franchot R., *Sixth* Scholarship for Proficiency, and *Second* Scholarship for Mathematics and Moderns,

Bruce, H. W., *Second* Scholarship for Classics and Moderns.

Edgar, W. W., *Third* Scholarship for Classics and Moderns.

COMMERCIAL BOYS IN SITUATIONS.

Percy Boultbee, Junior Clerk, Bank of Commerce, Hamilton, Ont.
J. C. Carruthers, Book-keeper, Emery Wheel Co., Preston, Ont.
S. W. F. Flack, Clerk, Bank of Montreal, Cornwall, Ont.
*W. C. Kerns, Book-keeper for Kerns & Co., General Dealers, Burlington, Ont.
E. V. Lesslie, Time-keeper for Collins Bay Rafting Co., Collins Bay, Ont.
E. J. Moores, Junior Clerk, East Saginaw Bank, East Saginaw, Mich., U. S.
R. A. Somerville, Clerk, Wyld, Darling & Co., City.
S. H. Snyder, Book-keeper, Reichart & Co., Waterloo, Ont.
*D. M. Spink, Book-keeper, City.
*W. P. Spink, Book-keeper, Spink & Co, Grain Merchants, City.
F. E. W. Smith, Book-keeper, Hudson Bay Co., Victoria, B. C.
*Walter Wickson, Book-keeper, Porter & Ronald, Winnipeg, Man.
*R. A. Whitney, Book-keeper, Merchants Bank, Preston, Ont.
H. R. Barnard, Clerk, Bank of Montreal, Woodstock, Ont.
*J. A. Wells, Collector, Bruce & Brown, St. Louis, Mo.
*R. D. Wanless, Book-keeper, Wanless & Co., Sarnia, Ont.

*Completed the prescribed course.

Others who left, but who did not complete any of the courses :

The Schools of Science	5
Machine shops	3
Mercantile pursuits	28
Manufacturing pursuits	8
Farming	7
Banking	5
Civil service	1
Architectural pursuits	1
Others	18
Total	76

ORGANIZATION.

The College class-rooms can accommodate about 300 pupils ; already over 8,000 of the youth of the Province have received their education in whole or in part within its walls. The number in each class averages about 24.

The School is divided into :

(1) The Upper School, comprising the Upper Sixth Form (Senior Leaving or Honor Matriculation Classes). Lower Sixth Form (Junior Leaving or Pass Matriculation Classes). Fifth Form.

(2) The Middle School, comprising the Fourth Form, Upper Modern and Upper Commercial Forms. Third, Lower Modern and Lower Commercial Forms.

(3) The Lower School, comprising the Second Form. First Form.

Each of the Departments of school work—Mathematics, Classics, Modern Languages, Sciences, Commercial Subjects, Drawing, Music and Physical Culture—is taught by specialists.

The course of instruction consists of :

(1) The Classical Department.

In this course the College is divided into six forms or grades and the regular curriculum extends over a period of six years, though by steady application and hard study some boys are able to pass through the six forms in five or even four years. The full curriculum embraces an extended course in Biblical knowledge ; Latin, Greek ; Arithmetic, Algebra, Euclid, Trigonometry ; French, German ; English Grammar, Literature and Composition ; History and Geography both ancient and modern ; Chemistry, Physiology, Physics, Botany ; Freehand Drawing, Vocal Music, Gymnastics, Fencing, Drill exercises and Swimming.

To complete the Classical Course the following subjects must be taken : Latin, Mathematics, English, History and Geography, and one of the following groups: (*a*) Greek, (*b*) French and German, (*c*) French and one of the Natural Sciences, (*d*) German and one of the Natural Sciences.

(2) The Modern or Science Department.

This course includes French, German ; English Grammar, Literature and Composition ; Modern History and Geography ; Arithmetic, Algebra, Geometry, Trigonometry ; Physiology, Botany, Physics and Chemistry (Theoretical and Practical) ; Drawing (the Primary Course of the Government Art School curriculum) ; Vocal Music ; Gymnastics, Fencing, Military Drill and Swimming.

To complete the Modern Course the following subjects must be taken : Mathematics, English, History and Geography, Natural Sciences and either French or German ; both are recommended.

To enter this Department the pupil must have passed through the First and Second Forms of the Classical Course, or must have passed the High School Entrance Examination.

It extends over a period of three years, and is a preparatory training for the School of Practical Science.

(3) The Commercial Department.

The design of this Department is to afford boys intended for business a thorough grounding in the English and Mathematical subjects of the Classical Department together with the French and German, and at the same time to give them an efficient training in book-keeping in all its phases possible, and a general knowledge of the routine of banking, store-keeping, shipping, insurance, business correspondence and the handling of commercial paper of all kinds. Shorthand is carried up to the point of efficiency as to speed, and type-writing as practically applied in turning out commercial documents is also taught. The complete course extends over a period of two years, and an effort is made in this Department to combine all the advantages of a practical business education with the mental culture of a Classical course. The qualifications for admission to this Department are the same as those required of boys entering the Modern Course, viz :

(1) Having passed out of the Second Form.

(2) Having passed successfully the High School Entrance Examination, or the equivalent of these.

(4) The Musical Department.

This Department includes a training in Vocal and Instrumental Music; Harmony and Counterpoint. Arrangements have been made for instruction on the Piano, Violin, Violoncello, Flute and Piccolo, Cornet and other brass instruments. Music as a part of the regular school work was introduced two years ago ; Sight-singing, or Solfeggio, was taught in the Lower and Middle Schools, except to those boys whose voices were undergoing the process of mutation.

The Glee Club, consisting of upwards of fifty boys, was organized during the year ; they met for practise in the public hall of the College on two afternoons a week.

The School Choir composed of both masters and boys was organized at the opening of the Session.

(5) The Art Department.

The following Course in Drawing was taught to the Lower and Middle School :—

(1) Free hand-drawing from the flat in pencil from ornamental designs in outline.

(2) Practical Geometry; The principles of Geometry applied to practical work in mechanical drawing.

(3) Perspective : Elementary Drawing of simple geometrical planes and solids in perspective to scale and with the use of instruments.

(4) Model Drawing : Free-hand Drawing in outline directly from models.

(5) Memory Drawing : Free-hand Drawing of simple objects from memory.

Arrangements were made for special pupils for more advanced work in mechanical drawing, and water color drawing.

This department was under the direction of Mr. R. Holmes, a full course graduate of the Ontario School of Art.

THE STAFF.

George Dickson, M.A., Principal and First English Master.
W. S. Jackson, B.A., Dean of Residence and First Classical Master.
G. B. Sparling, M.A., First Mathematical Master.
S. B. Leacock, B.A., First Modern Language Master.
A. Y. Scott, B.A., M.D., C.M., Science Master.
A. A. Macdonald, M.A., Second Classical Master.
D. Hull, B.A., Second Mathematical Master.
W. Allan Neilson, M.A., Second English Master.
O. Pelham Edgar, B.A., Second Modern Language Master.
A. D. Passmore, B.A., Third Classical Master.
F. W. Terry, B.A., Third English Master.
G. W. Johnson, Esq., First Commercial Master.
F. H. Carpenter, Esq., Second Commercial Master.
W. Elliott Haslam, Esq., Musical Director.
Percy W. Mitchell, Esq., Violin.
W. A. Forsyth, Esq., Piano.
George Bowles, Esq., Organist.
R. Holmes, Esq., Drawing Master.
Sergt. Halfpenny, Gymnastic and Drill Instructor.
———Mrs. Sewall, Matron.
James Thorburn, M.D., Physician.
J. E. Berkeley Smith, Esq., Bursar.

G. Frost, Janitor.
R. Saxby, Engineer.

THE LABORATORY.

The Laboratory is fairly well furnished with apparatus and chemicals. Adjoining it is the lecture room, built in the form of an amphitheatre. Models and charts of a high excellence are provided for the teaching of Bôtany and Physiology. The apparatus was used extensively to illustrate the lessons in Physics, especially in the department of Electricity and in Chemistry; Chemistry and Physics are taught experimentally; about 24 boys can work at once in the laboratory.

THE MUSEUM.

The Natural History collection of the school consists of preserved plants and skeletons of animals. There are also fossils and other specimens illustrating the Geology of the Dominion. Owing to the want of a suitable room in which to display these specimens they are kept in boxes, and brought out only when required to be used. Glass cases for our specimens should be put up in our hall-ways and class-rooms and thus make a beginning of a school collection. The collection will not grow until the specimens are mounted and displayed.

THE GYMNASIUM.

The Gymnasium is a lofty building, 80 ft. long and 40 ft. wide. It is furnished with the necessary appliances for teaching the new Physical Drill, and regular instruction was given in light and heavy Gymnastics, Calisthenics and Military Drill throughout the year. Physical culture is under the supervision of the College physician, who examines the boys from time to time as to their fitness to undergo gymnastic training. The boys were carefully measured and weighed twice during the year and the results entered in a book specially prepared for this purpose. In the lower and middle school physical drill is obligatory on all boys who are not incapacitated from taking it, and an opportunity is given to all of the Upper school to join the after-school classes. The instructor is always in attendance when the gymnasium is opened.

THE RINK.

Adjoining the gymnasium is a large covered Rink, used for drill in summer and skating and hockey in winter. This was built during the recent summer by day labor at a cost of about 2½c. per cubic ft. capacity,

THE SWIMMING BATH.

The Swimming Bath was also added during the summer; it is made of concrete cement, 15 ft. by 30 ft.; 6 ft. deep at one end and 3 ft. at the other. This bathing room is fitted up with dressing rooms and two shower baths supplied with hot and cold water. An instructor will be in attendance when the boys use the bath and every boy in residence will be taught how to swim. As the bath is heated by steam coils it will be used in winter as well as summer.

SCHOOL GAMES.

Much attention is paid to the physical development of the boys. Physical training forms part of the regular routine, and all boys who are not hindered by weak health are expected to take part in the school games. The part of the grounds set apart for this purpose covers over 20 acres. The boys are divided into sets for cricket and foot-ball, according to their proficiency. There are several lawn tennis courts prepared and the club numbered 44 members. For winter sports there is now a large covered skating rink, and several outdoor ones. As every means should be used to keep the boys fully employed while out of school, the importance of this department of school work cannot be overestimated. The chief athletic events of the year were the competitions for the "Macdonald Challenge Cup," and for the "Hendrie Cup." The "Macdonald Challenge Cup" was presented by A. A. Macdonald, M.A., Second Classical Master, for the annual Cross Country Run. It was competed for in the autumn. The "Hendrie Cup," presented by the Messrs. Hendrie of Hamilton for the annual steeple chase was competed for in May. On June 17th, the first athletic meeting took place on the new grounds. It was largely attended and the different events were contested for in a spirited manner. The prizes, which were provided by the friends of the school were presented by Mrs. William Hendrie of Hamilton in the Public Hall of the College.

MILITARY DRILL.

A Drill Association is organized among the various forms of the school; boys over 14 years of age, who are qualified physically for the work, may join the Rifle Company—a uniformed infantry company formed in accordance with the regulations of the Militia Department of Canada, and under the supervision of the Deputy Adjutant-General of Militia. The cultivation of an erect bearing, of a spirit of proper subordination to authority, and of a manly *esprit de corps* is the design of this department. The uniform which each member purchases for himself, consists of a dark blue shell jacket trimmed with white; trousers same material, and forage cap. The company is furnished, free of charge, with belts, bayonets and the Peabody rifle.

THE CAMERA CLUB.

The Camera Club was organized during the year and did very good work. A dark closet was fitted up with all the necessary appliances for developing photograph plates. There is a growing interest in the taking of photographs stimulated somewhat by prizes offered by the masters for the best work. During their leisure hours many of the boys, on wet days when they cannot go upon the play ground, work at photography. Lantern slides were prepared by the boys and several exhibitions of their work given.

THE READING ROOM.

The following papers and magazines were supplied to the College free of charge: Methodist Monthly Magazine. Christian Guardian, Evangelical Churchman, Canada Presbyterian, The Entomologist, The Horticulturalist, The Bee Journal, Truth.

The following were purchased by the school: The Century Magazine, Harper's Monthly, Outing, Leisure Hours, Sunday Magazine, English Illustrated, London Graphic, London Illustrated News, Sporting and Dramatic News, Harper's Weekly, Cosmopolitan, Life, Puck, Judge, Pictorial World, the Fliegende Blatter, Punch. The *Globe*, *Mail*, *Empire*, *World*, *News* and *Telegram*. The papers are kept in the gymnasium reading room, and the magazines and illustrated papers in the reception room.

EXHIBITIONS.

Ten exhibitions are annually competed for; one in each of the Departments of Classics, Mathematics, Modern Languages, Science, and General Proficiency, in the Fourth and Fifth Forms respectively. The holder of an exhibition is entitled to free tuition for the year next ensuing the winning of the same. These exhibitions were founded in 1841, and have been awarded every year since.

MEDALS.

1. His Excellency the Governor General's Silver Medal: This Medal is awarded annually to the boy who ranks first in General Proficiency at the Leaving Examination of the Sixth Form. It carries with it the rank of "Head Boy" for the year.

2. The J. Herbert Mason Medals (gold and silver): These medals are awarded annually to the two boys, members of the Upper School, who are considered by the masters and pupils to possess in the highest degree the following characteristics: "Cheerful submission to authority, self-respect and independence of character, readiness to forgive offence, desire to conciliate the differences of others and, above all, moral courage and unflinching truthfulness." It is through the liberality of Mr. Mason, who donated to the College Board $1,000 that these medals are annually offered for competition. The masters select six boys of the Upper School whom they consider to possess the required qualifications in the highest degree. These names are submitted to the boys of the Sixth, Fifth, Fourth, Upper Modern and Upper Commercial Forms, and they are there and then elected by ballot. The Gold Medal was won by W. H. Hargraft of Cobourg, and the Silver medal by A. R. Robertson of Arnprior.

PRIZES.

1. Sixth Form Prizes (awarded at the Leaving Examination each year): (1) The Classical Prize to the boy who ranks first in Latin and Greek. (2) The Mathematical Prize. (3) The Modern Language Prize for proficiency in English, French, German, History and Geography.

2. J. Ross Robertson Prizes: Books to the value of $150 have been presented annually to the College for the past ten years by J. Ross Robertson, Esq. They are

awarded in each form of the College for proficiency in Canadian History and Geography. No boy is allowed to take two prizes in the same school—that is, he may take it once in the Lower, once in the Middle, and once in the Upper School, and to be eligible for the prize in the Upper School he must be a pupil of the College for at least a year. These prizes consist of complete sets of standard English authors, encyclopædias or dictionaries.

3. The Howland Prize: Given by W. H. Howland, Esq., late Mayor of Toronto, to the pupil who ranks highest in his form. The competition for this prize is limited to the sons of old College boys.

4. The Mayor's Prize of the value of $25 in books, presented by R. J. Fleming, Esq., Mayor of Toronto, to the boy who made the most improvement in his studies during the year.

5. The Graham Prizes: These prizes are awarded by D. Graham, Esq., of Montreal, for a knowledge of Scripture History. The course prescribed for the examination included a general outline of the principal events recorded in the Bible, the special study of its great characters, one of the Gospels, and the memorizing of a large number of selected passages in both the Old and New Teataments. Six prizes were awarded—two in each of the great divisions of the school:

The Upper School prize was $20 in gold.

The Middle School prize was $10 in gold.

The Lower School prize was $5 in gold.

There were also three second prizes in books, each valued at $5.

PRIZE LIST, 1892.

I. His Excellency the Governor-General's Medal ..... *R. Franchot.

II. The Classical Prize ..... H. A. Bruce.

III. The Mathematical Prize ..... *R. Franchot.

IV. The Modern Language Prize ..... H. A. Bruce.

V. The J. Ross Robertson Prizes:

Form	*VI.*—	*W. J. Lander.
"	*V.*—	R. C. Wilson.
"	*IV. B. and U. M.*—	*John Harmer.
"	*IV. A.*—	(No award).
	Upper Commercial.—	*R. A. Whitney.
	Lower Commercial.—	*D. E. Wright.
Form III. B. and L. M.—		*Harry Burton.
"	*III. A*—	G. W. Ross
"	*II. B.*—	W. O. Watson.
"	*II. A.*—	Logie Macdonnell.
"	*I.*—	*A. M. Platt.

VI. Exhibitions (founded 1841):

Form V.—The Classical: (1) *Sandwell, B. K., (2) Moss, W. P. (*Reversion*).
" *The Mathematical:* (1) *Sandwell, B. K., (2) *Creighton, C. D. (*Reversion*).
" *The Modern Languages:* (1) *Sandwell, B. K., (2) *Creighton, C. D., (3) Moss, W. P., (4) *Wilson, R. C. (*Reversion*).
" *Science:* (1) *Leslie, F. G.
" *General Proficiency:* (1) *Sandwell, B. K.
Form IV.—Classical: (1) *Bolton, S. E., (2) *Biggar, O. M., (3) Boyd, P. Ryerson, G. E., (4) Bryant, J. F. (*Reversion*).
" *Mathematical:* (1) *Bradburn, C. H., and Macdonald, A. (equal).
" *Modern Languages:* (1) *Biggar, O. M.
" *Science* (not awarded).
" *General Proficiency:* (1) *Bolton, S. E.

VII. The Howland Prize ..... A. N. Platt.

VIII. The J. Herbert Mason Medal (Gold) ..... *W. H. Hargraft.

" " (Silver) ..... *A. R. Robertson.

IX. The Mayor's Prize ..... *G. G. Monerieff.

X. The Graham Prizes for Scripture Knowledge :

Upper School.—1. *R, Franchot (2nd Medal. 2. *G. G. Moncrieff. 3. *A. R. Robertson.
Middle School.—1 *R. W. Stovel (1st Medal). 2. *H. H. Lepper. 3. W. J. Shortreed.
Lower School.—1. L. Macdonald (3rd Medal). 2. *P. M. Beers. 3. D. K. Edgar.

XI. Gymnastics—1. Burnside, J, T. M.
2. Caldwill, A. C.

FORM V.

Year Prizes :
1. *Sandwell, B. K. 2. McMaster, T. G.

Examination Prizes :
Classics.—1. *Sandwell, B. K. 2. Moss, W. P. 3. *Creighton, C. D.
Mathematics.—1. *Sandwell, B. K. 2. *Creighton, C. D. 3. *Leslie, F. G. 4. *Boultbee, H. (prize).
Modern Languages.—1. *Sandwell, B. K. 2 *Creighton, C. D. 3. Moss, W. P. 4. *Wilson, R. C. 5. *Haskell, C. T.
Science.—1. *Leslie, F. G. 2. *Wilson, R. C. 3. Campbell, A. H.
Honorable Mention.—*Robertson, A. R.

FORM IV. B.

Year Prizes :
1. *Bolton, S. E. 2. *Biggar, O. M.

Examination Prizes :
Classics.—1. *Bolton, S. E. 2. Boyd, P. 3. *Biggar, O. M. 4. *Lepper, H. H. 5. *Corson, W. D. (prize).
Mathematics.—1. *Bolton, S. E. 2. Stovel, R. W. (prize).
Modern Languages.—1. *Biggar, O. M. 2. *Bolton, S. E. 3. Bryant, J. F. (prize). 4. *Ross, D. A.
Science.—J. Hanner.
Honorable Mention.—*Maclennan, F.

FORM IV. A.

Year Prizes :
1. *Bradburn, C. H. (prize). 2. McMaster, E. B.

Examination Prizes :
Classics (Latin only). 1. *Turner, R. F. (prize).
Mathematics.—1. *Bradburn, C. H. and Macdonald, A. A. (æq). 2. Wood, T. H. (prize).
Modern Languages.—1. *Bradburn, C. H. 2. *Turner, R. F. 3. Muir, J. G. (prize).
Honorable Mention.—Anderson, W. J.

FORM III. B. AND L. M.

Year Prizes :
1. *Burton, H. T. 2. Macdonnell, J, S. 3. *Page, C. A. 4. *Biggar, J. L.

Examination Prizes :
Classics.—1. Macdonnell, J S. 2. *Burton, H. T. 3. *Biggar, J. L. 4. Moss, G. F. 5. *Todd, J. L. 6. Cameron, M. C. (prize).
Mathematics.—1. *Burton, H. T. 2. *Todd, J. L. (prize).
Science (Chemistry).—Kingsford, G. E.
Modern Languages—1. *Burton, H. T. 2. Macdonnell, J. S. 3 *Biggar, J. L. 4. *Todd, J. L. 5. Montizambert, W. H. (prize).
Honorable Mention.—Kingsford, G. E. Frankland, A. H. *Brooke, L. W.

FORM III. A.

Year Peizes :
1. *Bucke, E. P. 2. Kerr, W. A. R. 3. *Hunter, F. F.

Examination Prizes :
Latin.—1. *Hunter, F. F. 2. Bucke, E. P. 3. *Smith, E. and Kerr, W. A. R. (æq). 4. *Armour, E. (prize).
Mathematics.—1. Kerr, W. A. R. 2. Elmer Smith (prize).
Modern Languages.—1. *Kerr, W. A. R. 2. *Hunter, F. F. 3. *Bucke, E. P. 4. Armstrong, B. M. (prize).
Honorable Mention.—*Armour, E. Shortreed, W J. Steele, C. Ivey, A. M.

UPPER COMMERCIAL.

Year Prize.—*Smith, F. E. W.
Commercial.—Spink, D. M.
Modern Languages.—*Kerns, W. C.
Mathematics.—*Wickson, Walter.
Phonography.—*Whitney, R. A.
Honorable Mention.—*Wanless, R. D.

LOWER COMMERCIAL.

Year Prize.—1. *Wright, D. E. 2. *Snyder, I. D. 3. *Bricker, A. E. 4. Draper, S.
Commercial.—1. *Draper, S. 2. *Flack, A. W. F. (prize).
Modern Languages.—1. *Wright, D. E. 2. *Philbrick, F. S. (prize).
Mathematics.—1. *Snyder, I. D. 2. *Wright, D. E. 3. *Rayside, D. J. (prize).
Phonography.—1. *Draper, S. and *Boultbee P. R. (æq.) (prize).
Honorable Mention.—Bertram, J. A *Conrad, C. *Sims, H. A. *Macnee, A. F. Burden, E. L. *Hyman, W. J. *Moore, C. V. *Meighen, W. A. *Wilson, N. F.

FORM II. B.

Year Prize :
1. Watson, W. O. and McLaughlin, L. (æq.) 2. Cartwright, R. J.

Examination Prizes :
Classics.—1. McLaughlin, L. 2. *Palmer, E. and *Snetsinger, H. (æq.) (prize).
Mathematics.—1. Watson, W. O. 2. Edgar, D. K. (prize).
Modern Languages.—1. McLaughlin, L. 2. Watson, W. O. 3. Edgar, D. K. 4. *Lewis, C. A. (prize).
Honorable Mention.—*Palmer, J. C. Cartwright, R. J, *Snetsinger, H. Edgar, D K. *Hewetson, J. S.

FORM II. A.

Year Prize :
1. Macdonnell, L. 2. McMaster, A. 3. Chewitt, A.

Examination Prizes :
Latin.—1. Macdonnell, L. 2. Nisbitt, W. (prize).
Mathematics.—1. Macdonnell, L. 2. McMaster, A. 3. Chewitt, A. 4. Jackes, H. M. (prize).
Modern Languages.—1. Macdonnell, L. 2. McMaster, A. 3. Nisbett, A. 4. Chewitt, A. 5. Selby? (prize).
Honorable Mention.—Ryerson, S. E. *Atkinson, P. McKinley, W. W.

FORM I. A.

Year Prize :
1. *Platt, A. M. 2. *Platt, S. H.

Examination Prizes :
Classics.—1. Gillespie, H. H. (prize).
Mathematics.—Boon, C. A. (prize).
Modern Languages.—1. Gillespie, H. H. 2. *Platt, A. M. 3. *Caldwell, J. B. (prize).
Honorable Mention.—*Caldwell, B. A. C. James, A.

SPECIAL LECTURES.

The following lectures were delivered on Friday afternoons in the Public Hall of the College :—

"Canals of Canada," by H. B. Witton, Inspector of Canals for the Dominion.

"Entomology," by Captain Gamble Geddes.

"Forestry," by R. W. Phipps, Forestry Commissioner of Ontario.

"Comparative Sanitation of Toronto, Cleveland, and Detroit," by Peter H, Bryce, M.A., M.D., Secretary of the Board of Health.

"Land Transfers," by J. Herbert Mason.

"Mineral Resources of Ontario," by Archibald Blue, Commissioner of Mines.

SPECIAL SERMONS.

The following clergymen preached special sermons to the boys in the Public Hall of the College on Sunday mornings :—

Rev. C. H. Mockridge, D.D.

Rev. W. G. Wallace, M.A.

Rev. D. J. Macdonnell, B.D.

Rev. John Gillespie, M.A.

THE BOARDERS.

Occupy the dormitories of the College building, and are under the immediate supervision of the Principal and the Dean of Residence. In each section of the building there are from twenty-five to thirty-five boys presided over by a resident master. The system adopted is that of single or double bed-rooms, furnished in a substantial home-like manner. The bedsteads are made of iron, each furnished with a steel woven spring mattress, upon which rests another of the finest quality of horse hair, made especially for the College. The health and comfort of the boys are looked after by an experienced matron. There are spacious and comfortable quarters, isolated from the rest of the boys' rooms for sick boys who are under the immediate care of the matron. All the boarders except the senior boys prepare their work in the presence of the study masters, whose duty it is to supervise and direct the boys in their studies. Boys in the Sixth Forms, as a rule, are allowed to prepare their work in their own rooms. Four large class-rooms are used as studies during the evening and before school every morning.

On Sunday, all boarders, whose guardians do not object to it on religious grounds, receive instruction in the College Sunday Schools. Classes for the study of the bible are held every Sunday morning before church ; in the morning at 9.30 o'clock, morning service is held in the Hall, and at least once a month, there are special sermons for boys. These services are conducted by city clergymen and others throughout the Province.

For the convenience of boarders living at a distance, it has been arranged that they may remain in the building during the vacation at Christmas and Easter ; but a special charge of $4.50 per week is made in each case.

The boarding house is conducted as an integral part of the institution, and the charges are as low as is compatible with the liberal style in which the establishment is conducted —profit not being the object, but the supplying of a need felt by the country at large, namely : a well managed boarding house, in which, while the boys enjoy all the advantages of the educational system of Upper Canada College, their parents may feel confident that the moral, physical and aesthetic culture of their sons is a subject of serious attention.

Every boarder is required to bring with him a certificate of good conduct from the master or tutor under whom he has been previously educated. One month's notice is required before the removal of a boy.

A limited number of day boys, residing at a distance from the College, have the privilege of lunching at mid-day in the College Boarding House on paying $9.00 per term.

THE NEED OF A RESIDENTIAL SCHOOL LIKE UPPER CANADA COLLEGE.

There is a demand for a residential school like Upper Canada College. Those who reside where there is no High School are compelled in consequence of this to send their sons from home for an education.

The one hundred and twenty High Schools and Collegiate Institutes of the Province are altogether Day Schools. The risk and responsibility incurred in placing Boarding Houses in connection with them are greater than either the Board of Trustees or the Masters themselves care to undertake. The consequence is that unless there was such an institution as Upper Canada College there would be no residential school in the Province subject to official independent inspection and directly responsible to the public for its efficiency. These High Schools provide secondary education for about one-half of the population of the Province; the other half are of necessity compelled either to send their sons to institutions wholly under the control of the religious denominations and not directly responsible to the public for the efficiency of the work done therein, or they have to send them to High Schools situated in towns and villages to board wherever they can get lodgings, attending as day pupils at these schools. This arrangement of house and school gives, in no sense, the training of a good residential school; both must be under one head; there must be unity of aim, and everything connected with both must be subsidiary to the main work of training. Even if a few boys lived with the masters of these High Schools they would lose the benefit that a properly organized residential school is able to confer, more especially one with such a history as Upper Canada College possesses. It is an undisputed fact that the historical associations of a school are an educational force of great value. The system of educating boys away from home is likely to increase as wealth accumulates. There are many so much absorbed in business and public duties that it is impossible for them to look after the home training of their children. This class is an important one and is made up largely of business and professional men. The home life yielding to the demands of society and the calls of business, the boys are left either to the training of servants, if they are to attend the day school, or they must be sent away from home for an education. Is it not reasonable that this class upon whom devolve the cares of great undertakings and often public duties of an engrossing kind should have a school where they can place their sons knowing that they will be looked after carefully by officers directly responsible to the state for the efficient management of the institution placed under them? These in all cases contribute largely to the support of the local schools, and it is surely only common justice to provide a thoroughly equipped residential school where they can with confidence send their sons.

Then too the sickness or perhaps the death of one or both of the parents makes it necessary to seek the assistance of the residential school in order that their boys may receive that training which the home is unable to give through no fault of its own. This class alone, as regards numbers and importance in the State, is as deserving of special provision for the education of their sons as any other in the community for whom special institutions are provided.

There is a large class in the community, and it is increasing in numbers, who consider the residential school training the best. There are those who think that the training imparted by a good residential school is the best discipline for citizenship that a boy can receive. Without underrating the healthful influence of a good home, it may be urged that educated men specially trained to deal with the young, devoting their thought

and time through life to the theory and practice of education in thoroughly equipped institutions where the whole daily life is kept subsidiary to the main work of training, ought to attain results not to be expected from the irregular and undisciplined superintendence of even conscientious parents. Skill counts for as much in the training of the young as it does in any other business of life. In day schools the laxity of home discipline often neutralizes the best efforts of the best teachers. Were it not for the steadily increasing fee, which the financial condition of the College makes it necessary to impose, this class would be largely represented in the College. The lowering of the fees even to what it was five years ago, would I am convinced largely increase the attendance of residential pupils.

The residence of the institution should be self-supporting and more, but the class-room department of the College should not be supported from fees alone. The High Schools and Collegiate Institutes of the Province receive about 20°/₀ of their income from fees; they lack 80°/₀ of being self-sustaining. For the assured success of the College for all time its class-room department should have the same chance as the Collegiate Institutes and High Schools of the Province. The fee for tuition alone is $60.00 a year; the highest fee paid in a High School or Collegiate Institute is $20 a year.

THE NEW COMMERCIAL COURSE.

The Course extends over two years, and applicants for entrance must have passed successfully the High School Entrance Examination or its equivalent. The following papers set for examination in June, 1892, Lower Commercial (Promotion Examination) and Upper Commercial (Leaving Examination) will give a better idea of the work done in this newly established course than any mere description could give. On these papers *thirty-two* students passed from the Lower Commercial to the Upper, and *seven* passed the Leaving Examination and received Certificates.

[L. C.] BANKING AND BUSINESS FORMS, JUNE, 1892.

LIMIT.—The routine of deposit and withdrawal; the duties of Teller and Ledger-keeper; all kinds of receipts, drafts and promissory notes.

1. Explain fully, step by step, how you would proceed, as a merchant, to open a deposit account in the Upper Canada College Bank.

2. Explain what the different bank officers would do.

3. Write a cheque on your bank for $10.00 to give to J. B. Rogers, for coal, so that it will serve you as a receipt.

4. Trace the course of this cheque from your hands till it returns to your hands.

5. Explain a method of keeping your bank account on your cheque stubs.

6. How will you preserve for convenient future reference, (*a*) paid cheques, (*b*) receipts and paid bills, (*c*) invoices?

7. Jones gives Smith a draft on Brown at 10 days. Write the draft, and explain the responsibility of the parties (*a*) before Brown accepts it, (*b*) afterwards.

8. Write a promissory note, negotiable without indorsement, payable to J. Brown, at the Upper Canada College Bank, 90 days after date, June 27th, 1892, no interest.

9. B. Black and G. Brown give J. Grey a joint note for $100, payable whenever Grey asks for it. Write the note.

10. Explain the peculiar features of (*a*) an order for cash, (*b*) a cheque, (*c*) a sight draft, (*d*) a draft after sight, (*e*) a draft after date, (*f*) a bank bill.

Value 100 marks.

[U. C.] BANKING AND BUSINESS FORMS, JUNE, 1892.

LIMIT.—As for Lower Commercial; discounting, collecting, bank drafts, protesting, clearing house. All kinds of business forms, the customs of trade.

1. Give the outlines of the Canadian Banking Act.

2. Explain Signature Book, Bank Pass Book, Deposit Slip.

3. Explain what books, if any, are necessary to record the transactions of the Receiving Teller—how he accounts for the cash received during the day and what he does with it.

4. Explain what records, if any, are made by the Paying Teller—how he gets and accounts for the cash paid out during the day.

5. What is the difference between a notice of protest and a notice of dishonor What is the object of such notices? Who always resort to the former?

6. Explain the routine of discounting (*a*) as to the merchant, (*b*) as to the bank.

7. You, in Toronto, wish to pay Smith, in Ottawa, $100 00. Explain the advantages and disadvantages of the following methods of payment: (*a*) registered letter, (*b*) P. O. order, (*c*) your own cheque, (*d*) a bank draft.

8. Explain concisely how you would procure a bank draft.

9. You, in Toronto, wish to collect from Brown, of Montreal, a debt of $100.00. Explain how merchants usually do this.

10. On June 1st you sold merchandise to Joseph Brown, $50.00, and received in payment Mason's acceptance, favor of Brown or order, dated May 25th at 30 days' sight. Write this document exactly as it was after you had accepted it as payment.

Value 100 marks.

[L. C.] BUSINESS COMPOSITION AND CORRESPONDENCE, JUNE, 1892.

LIMIT.—Reports of meetings, letters, circulars, telegrams, advertisements, transcriptions, precis-writing, accounts of local events.

1. You are a retail Boot and Shoe Dealer. Write a "taking" advertisement for the "Evening Boomerang."

2. The following item appeared in this morning's "Times": As we go to press (3 o'clock, a.m.,) a fire is raging in Peter Green's Wholesale Millinery Establishment, on Front Street. The porter, William Smith, is said to have been asleep in the attic; if so, the poor fellow has doubtless perished, for the whole building is in flames. Mr. Green is at present in Paris."

(*a*) As news reporter on the evening "Argus," write a fuller account of this fire.

(*b*) As the late porter's friend telegraph suitably to his father, John Smith, Pacific Hotel, San Francisco.

(*c*) Write the "Death notice" for the paper.

(*d*) As Green's Book-keeper cable the news (50c. per word) to Mr. Green, 13 Rue Rivoli, Paris.

3. What is precis-writing? Explain its usefulness.

4. You are a Retail Grocer on the corner of Young and Old Streets. Write a Christmas circular, which you intend to get printed, and post to your customers, relative to past favors and future patronage.

5. James Jones, Port Hope, has long owed you, in Toronto, $15.00, the balance of an account. You wrote him, January 1st, asking for a remittance. Getting no reply you wrote, (February 1st), expressing surprise and urging an immediate settlement; no response. March 1st, you wrote threatening legal proceedings. Write these three letters.

Values, (1) 10; (2) 20 + 10 + 10 + 10; (3) 10; (4) 10. (5) 20.

[U. C.] BUSINESS COMPOSITION AND CORRESPONDENCE, JUNE, 1892.

LIMIT.—As for lower Commercial, minutes of meetings, resolutions, market reports, summaries, transcriptions, partnership agreements, memorandum agreement with clerks, etc.

1. The following notice appeared in this morning's "Sentinel":

Public Meeting.—In accordance with a resolution of the Toronto City Council, a public meeting will be held in the Pavilion, this (Monday) evening for the purpose of arranging for the reception of the Right Hon. Sir Edward Blake, Lord-Lieutenant of Ireland.

(Signed), J. JENNINGS, Mayor.

As reporter on the "Loyal Canadian," attend this meeting and write a brief account of it, giving the two resolutions that were carried.

2. Write the memorandum of an agreement between yourself, a druggist, and William Smith, clerk.

3. Write an advertisement for the "Globe" offering your services as a book-keeper.

4. Write in reply to the following advertisement:

Wanted.—A junior office-hand—a graduate of Upper Canada College Commercial Course preferred. State experience, and salary expected. Apply by letter to Ross & Robertson, Toronto.

5. You and John Jones enter into partnership, to-day, June 27th, 1892, for five years as General Produce and Commission Merchants, under the firm-name of———— and Jones. Each puts in $2,000 and is to give his whole time and attention to the business. You are to keep the books, sign the firm-name, and manage generally. Jones is to look after consignments and sales. Losses and gains equal. Write this partnership agreement.

Values, 25 + 20 + 10 + 10 + 35.

[L. C.] COMMERCIAL LAW AND USAGES, JUNE, 1892.

LIMIT.—Commercial terms, the law of contracts, negotiable paper.

1. Explain fully, (*a*) days of grace, (*b*), indorsement in blank, (*c*) indorsement in full, (*d*) an acceptance, (*e*) the act of acceptance, (*f*) par, (*g*) dishonor, (*h*) net worth, (*i*) balance of trade, (*j*) deficit. (Value 30.)

1. (*a*) What is a contract? (*b*) What is meant by the consideration? (*c*) What may this consideration be? (*d*) What contracts must be in writing? (*e*) Why may no contract be partly written and partly verbal? (*f*) What persons are not competent to contract? (*g*) What contracts made by a minor are valid? (*h*) How large a sum can be sued for in a Division Court? (*i*) Are contracts, verbal or written, made on Sunday valid? (*j*) When is a "bid" at an auction binding? (Value 30).

3. (*a*) What is meant by negotiable paper? (*b*) Give the different names applied to it. (*c*) Write a non-negotiable paper. (*d*) Write one negotiable by indorsement. (*e*) One negotiable without indorsement. (*f*) Does a bank-bill belong to any of these, if so which? (*g*) Is a note dated on Sunday valid? why? (*h*) Who is the first endorser in a draft? (Value 40).

[U. C.] COMMERCIAL LAW AND USAGES, JUNE, 1892.

LIMIT.—As for Lower Commercial, agency, customs, insurance, partnerships, joint stock company and other liabilities.

1.—(*a*) What is an agent? (*b*) To what extent does his act bind his principal? (*c*) What caution is necessary in dealing with an agent? (*d*) What is power of attorney?

(*e*) What is the difference between an attorney-at-law and an attorney in fact? (*f*) Define insurance, (*g*) define policy, premium, risk. (*h*) What is a mutual insurance company? (Value 32.)

2.—(*a*) Define customs duties, (*b*) tariff, (*c*) specific duty, (*d*) ad valorem duty, (*e*) free trade, (*f*) reciprocity, (*g*) revenue tariff, (*h*) protective tariff. (*i*) Why are customs duties collected? (*j*) How else might this be accomplished? (Value 40.)

3.—(*a*) What is a joint stock company? (*b*) What is meant by "limited liability?" (*c*) Who are under "unlimited liability?" (*d*) Who are under "double liability?" (*e*) How is limited liability made known to the public? (*f*) What is meant by "preference stock? (*g*) How are joint stock companies started? (Value 28.)

[L. C.] ALGEBRA, JUNE, 1892.

LIMIT.—The Simple Rules, factoring, Easy Simple Equations.

(The printer not having the proper type and algebraic symbols, the questions in Algebra have to be omitted.)

[U. C.] ALGEBRA, JUNE, 1892.

LIMIT.—As for Lower Commercial, fractions, simple equations of two unknown quantities, easy quadratics. The chief object in teaching this subject is to enable the pupil to interpret algebraic formulæ.

(The printer not having the proper type and algebraic symbols, the questions in Algebra have to be omitted.)

[L. C.] SPELLING, PUNCTUATION, AND CAPITALS, JUNE, 1892.

LIMIT.—High School Reader and every-day words; the use of Points and Capitals.

1. The examiner will dictate the following sentences, but the pupil will write the words in italics only:—

Write a *promissory* note. Never *despair*. Act with *dispatch*. He made the *ascent* in February. The mountains are *inaccessible*. What is our *latitude* and *longitude?* His *movable* property is not *ratable*. I can *discern* no mistake. The *barber* is *singeing* my hair. It is a *barbarous practice*.

Value 30, less 4 for each error.

2. Re-write the following words, making changes in the spelling if necessary:

wield	ballence	gayity	properiety	dipthera
siege	interduse	steadfest	fullfill	tifoid fever
intelagent	blamable	partical	piteous	cubboard
divide	mischieveous	infinitive	recompense	sauspan

Value 20, less 2 for each error.

3. Write each of the following sentences twice, and punctuate them so that with one punctuation they will mean one thing, and with a different punctuation, a different thing:—

Smith said Brown was a humbug.
James my brother has your book.
He said with a smile you have won my heart.

Value 18.

4. Re-write the following, using capitals and points properly :—

my dear sir you ask me what mr J Jones jr told me when I met him last fall out west said I on meeting him how do you do that is none of your busiuess he replied that your health is none of my business I acknowledge said I I will tell you what is my business what did you do with doctor Smiths money that he replied with a laugh is my business oh it is is it said I yes it is he retorted and advising me to mind my own business said he was fully capable of attending to his own.

Value 32, less 4 marks for each error.

[U. C.] SPELLING, PUNCTUATION, AND CAPITALS, JUNE, 1892.

LIMIT.—As for Lower Commercial, and commercial terms with meanings.

1. The examiner will dictate the following sentences, but the pupil will write the words in italics only :—

A book is said to be *neuter* gender. The whole army was *massacred.* He *uttered* a *piteous* cry. *Movable* property is sometimes *ratable.* His statements are always *explicit.* His health has been *benefited.* I *inferred* that you drew that *inference.* Look at the *pinnacle* of the *pavilion.*

Value 20, less 4 for each error.

2. Write sentences in which each of the following words is properly used, (a sentence for each word) :—

rout	rite	vale	peer	ceiled	recipe
route	feint	ceded	tier	teem	receipt

Value 10, less 2 for each error.

3. Define the following words :—

garnishee	blank credit	compromise	consignment
tariff	contraband	trade discount	assignee
deficit	audit	lien	liquidate
insolvent	power of attorney	sine die	per pro
ad valorem	ultimatum	assets	to wit

Value 20, less 2 for each error.

4. Give ten rules for the use of capitals.
Value 10.

5. When (all cases) do you use a period, an exclamation, a dash, a parenthesis?
Value 10.

6. Transcribe (re-write) the following with proper points and capitals :—

one spring morning farmer brown found a fox in his trap ah you rascal said he ive got you at last have i yes replied reynard and as you love mercy you will help me out of this difficnlty oh i love mercy and so have regard for the feelings of my geese but said the farmer ill help you out of the trap as soon as towser comes towser was his dog oh sir said the fox ill never steal geese again now you are speaking the truth laughed the farmer as towser came in sight the fox began to cry mercy mercy but without avail.

Value 30, less 4 for each error.

[L. C.] ENGLISH LITERATURE, JUNE, 1892.

LIMIT.—Selected passages from the High School Reader.

"The Cloud."—*Shelley.* Verses 1 and 2.

1.—(*a*) By reference to lines 5-8 explain the practical value of personification. (Value 5.)

(*b*) State concisely in the order of the poem the natural phenomena which Shelley here represents poetically. (Value 5.)

(*c*) Explain the italicized parts. (Value 10.)

2. What difference should be made in the reading, between lines 19-20 and lines 21-24. (Value 3.)

3. Assigning reasons, mark with vertical lines the pauses to be made in reading lines 11, 27, 28. (Value 5.)

4. Reproduce the substance of "The Lord of Burleigh," displaying suitable taste and feeling. (Value 10.)

5. Quote from "The Cloud" what you consider the choicest specimen; also from "The Lord of Burleigh." (Value 5.)

6. What is Huxley's answer to the question: "How shall I live to make the most of my life?" Give his own words when you can. (Value 7.)

[U. C.] ENGLISH LITERATURE, JUNE, 1892.

LIMIT.—Selected lessons from High School Reader.

1. "The Cloud."—*Shelley.* Verses 1 and 2.

(*a*) State concisely in the order in the poem, the natural phenomena which Shelley here represents poetically. (Value 5.)

(*b*) Discuss his representations of these phenomena. (Value 5.)

2. State with reasons which is preferable (verses 1-2): "dews or rains," "noon-day or mid-day," "dances or whirls," "wield or swing," "dissolve or melt," "great pines or large oaks," "lured or led," "dream or dreams. (Value 10.)

3. Develop the aptness of the expressions, "rocked to rest," "mother's breast," "laugh," "sift," "skyey bowers." (Value 5.)

"The Lord of Burleigh."—*Tennyson.*

4. With suitable taste and feeling displayed, reproduce the substance of "The Lord of Burleigh," quoting at times passages of special beauty or aptness. (Value 10.)

5. Quote Shelley's description of "Moonlight over the Lake." (Value 5.)

6. How does Huxley explain that life is "a game of chess?" According to him what are the rules to be learned, and how comprehensive are they? (Value 10.)

[L. C.] BOOK-KEEPING, JUNE, 1892.

LIMIT.—Single Entry and Double Entry, both retail and wholesale. Use of Sales Book, Invoice Book, Journal, Cash Book, Bill Book and Ledger.

1. What do you mean by books of original entry? Single entry? Double entry? Balance sheet? Trial balance? (Value 20.)

2. What must be proved in court when you sue a book-debt? (Value 10.)

3. Explain clearly what books you would use in a single entry grocery set; and how at the end of the year you would find the gain or loss. (Value 30.)

4. Having closed the single entry ledger and made out a balance sheet, how would you now change your books to double entry? (Value 20.)

5. Name the advantages and disadvantages (*a*) of Single Entry Book-keeping, (*b*) of Double Entry Book-keeping. (Value 20.)

6. Give rules for Journalizing (*a*) at beginning business (*b*) at close of business, (*c*) during business. (Value 10.)

7. Brown gave a sight draft on Smith in favor of Green (it is honored) for $10. Give (*a*) Brown's entry, (*b*) Smith's entry, (*c*) Green's entry. (Value 20)

8. Black gave White a draft at ten days on Gray for $30, which is honored. Give (*a*) Black's entry (*b*) White's entry (*c*) Gray's entry. (Value 20)

9. Sold Thompson Mdse. $300 and received in payment cash $50, sight draft on Jameson $50, cheque $50, Blue's acceptance favor of Thompson $50, an order on Holmes for $25, which is honored, an order on Henderson for $25, which at his request is placed to his account, and Thompson's note for the balance. Give (*a*) your entry, (b) Thompson's (*c*) Jameson's (*d*) Henderson's. (Value 40.)

10. What is the object of keeping a Bill Book? A special column Cash Book? (Value 5.)

11. Give rules for detecting errors in a trial balance. (Value 5.)

12. How would you proceed to close a set of Double Entry Books? (Value 5.)

[U. C.] BOOK-KEEPING, JUNE, 1892.

LIMIT.—As for Lower Commercial; Commission Business, Manufacturing, Railroad and Steam-boating, Municipal Accounts, Executor's Books, Joint Stock Company Book-keeping.

1. Define Balance Sheet, Financial Statement, Consignee, Joint Stock Company, Debenture, Coupon, Time Register, Audit, Voucher, Shipment. (Value 20.)

2. Jones gave Green a sight draft for $30.00 on Brown. It is honored. Give (*a*) Jones' entry, (*b*) Green's (*c*) Brown's. (Value 20.)

3. Explain fully the formation of the Hamilton Steamboat Co. What books are required to record its business? Give what you consider would be a good form for a Cash Book for its business, (having special columns.) (Value 20.)

4. Describe the books you would use for a Stove Manufacturing Co. Make out a weekly Time Sheet and Pay Roll for its 14 hands. (Value 20.)

5. Give what you would consider a good form for a Special Column Cash Book for the Toronto City Treasurer's Office. (Value 20.)

6. State the relative advantages and disadvantages of Book-keeping by Single Entry, by Double Entry, (Value 20.)

7. State rules for journalizing (*a*) Shipments from start to finish, (*b*) Consignments from receipt to finish. (Value 20.)

8. Jones of Bracebridge sends you to sell on his account and risk 1,000 bushels of wheat. Make out (*a*) the Invoice he sends you with the wheat, (*b*) your Account Sales which you send him after the sale. (Value 20)

9. How would you close a Single Entry Set of Books, find the loss or gain, change the books to Double Entry? (Value 20.)

10. You sold Brown merchandise $400.00, and received in payment, cash $50.00, a sight draft on Holmes $50 00, a draft at 10 days on Johnston $50.00, a cheque $50.00, your own note, Brown's favor $50, an order on Thomas $50 00, which, at his request is passed to his account, the balance on account. Give (*a*) your entry, (*b*) Holmes' entry, (*c*) Johston's entry, (*d*) Thomas' entry, (*e*) Brown's entry. (Value 20.)

[L. C.] FRENCH, JUNE, 1892.

LIMIT.—II. Part High School French Grammar, pp. 1-26 High School French Reader.

1. Translate into French :—

(*a*) John has a horse and carriage and I have a house and garden.

(*b*) We are with the ladies and children in the carriage under the tree.

(*c*) Have the gentlemen the horses and the dogs?

(*d*) Where is the church in your village? Here it is behind the trees.

(*e*) I have only one franc in my pocket, but I have three francs in a box in my room.

(*f*) Why does not Mary give her cousin (f) the book? Because she hasn't it.

(*g*) Why do you not give them to him? Because he does not not ask for them.

(*h*) Have the children silk dresses? No, madam, they have no silk dresses.

(*i*) Mary does not wear her silk dress because she is afraid of tearing it.

(*j*) Are we right in giving him money? No. sir, you are wrong; he does not need money.

2.

(*a*) Write out the present indicative active of Avoir, Être, Donner, Finir, Rompre.

(*b*) The interrogative and negative forms of Avoir (present, indicative, active.)

3. Give examples, and explain the agreement of the past participle.

4. Ne-pas, ne-point, ne-jamais, ne-que, ne-plus; illustrate their use, giving sentences for each, give the English also.

5. Exemplify the five ways in French of asking questions.

[U. C.] FRENCH, JUNE, 1892.

LIMIT.—High School French Grammar to the end of irregular verbs. The whole of the High School French Reader. Special attention to Commercial Correspondence in French.

1. Explain any peculiarities in French regarding the use of (*a*) the articles, (*b*) possessive adjectives, (*c*) possessive case, (*d*) indirect object. Give one example for each separate remark.

2. Write out the indicative mood (active) of the verbs, Avoir, Parler, Rendre, and the principal parts, the imperative and subjunctive moods (active) of the verbs Finir, Être.

3. Exemplify five ways in which the French ask questions.

4. Translate into idiomatic French :—

(*a*) Have you finished your lessons, my children? We have not yet finished them.

(*b*) Why does not Mary wear her silk dress? Because she has torn it.

(*c*) Were you cold yesterday? Yes, sir, we were very cold.

(*d*) Why do you not light the fire? Because we do not want the fire; we are warm enough.

(*e*) The fox tried to attract the chickens with fine words.

(*f*) The fox ran away with all haste.

(*g*) Perhaps the two dogs have not yet heard the news.

(*h*) We must not take vengeance on our enemies.

(*i*) I was the first to see it (f).

(*j*) For we are the only two who have our hats on our heads.

[L. C.] READING, ELOCUTION AND NEWSPAPERS, JUNE, 1892.

LIMIT.—High School Reader, principles of Elocution, Recitations, Newspaper Literature.

1. Reading (a selection of not more than half a page of the High School Reader.) (Value 12.)

2. Recitation (a selection made by the pupil, memorized.) (Value 12.)

3. Divide the following words into syllables and mark their accent:—Influence, interesting, contrary, illustrate, astronomical. (Value 5.)

4. What do you mean by emphasis? pitch? tone? modulation? clearness of articulation? (Value 5.)

5. Explain the following expressions from last night's paper:—(*a*) Redistribution Bill, (*b*) A Scandalous Gerrymander, (*c*) Fluctuating Market, (*d*) Spot Wheat, 90c., (*e*) Bank of Montreal, 221½c. bid, (*f*) Brown & Co. are asking for an extension, (*g*) House for Sale, no encumbrance, (*h*) The Boston Rubber Co. is asking Oakville for a bonus and exemption. (Value 16.)

[U. C.] READING, ELOCUTION AND NEWSPAPERS, JUNE, 1892.

LIMIT.—As for Lower Commercial, the financial, commercial, news and advertising columns of newspapers, the routine of public meetings, resolutions and debates.

1. Reading, (a selection from a daily paper.) (Value 10.)

2. Recitation, a selection made by the pupil and memorized, in which he is expected to apply the principles of elocution.) (Value 10.)

3. "After all the Daily Paper is the business man's great text-book." Discuss and defend this statement. (Value 8.)

4. Explain the following expressions from last night's paper:—(*a*) Cotton is down, uplands 8½c., (*b*) Bulls and Bears, (*c*) Dun, Wiman & Co,'s Agency, (*d*) Consols 96¼c., (*e*) the Behring Sea *modus vivendi*, (*f*) mare clausum, (*g*) The Toronto Stock Exchange, (*h*) gone into liquidation, (*i*) the Schooner Belle Brown cleared, light, (*j*) It is no gerrymander, (*k*) Home Rule for Ireland. (Value 22.)

[L. C.] GERMAN, JUNE, 1892.

LIMIT.—Pupils are allowed to select either French or German, but are permitted to pursue both if their time will permit. The High School text-books are used, with special instruction in the phraseology and idioms peculiar to business correspondence in these languages.

1. Translate:—Bread, the bread, some bread, a little bread, wine and water, milk and flour, gold or silver, meat, but not beer.

2. Translate: The girl's mother. The master's stick. The pupil's master. The mother's book and pen. The boys' knives. The girl's knife.

3. Which brother? which newspaper? which house? This garden. Those bones. That woman. Every man.

4. My father and mother. Our carriages. Your brother-in-law. His friend. Her uncle. Its foot. Their birds. To the city. For the weather. Of the painter.

5. There is no fire in the stove. The weather is very hot. The trees are green in the spring. Apples are ripe in autumn.

6. No, not, not a, none, not at all, not yet, never, again.

7. Decline, diser Sohn, jeder Monat, im Apfelbaum, welches Dorf, jener Leif, welche Hand, jene Lochter, unser Leppich, ihr Offizier, jedes Fraulein. Give the English of each phrase.

8. Mention four prepositions that take the accusative. Make a sentence using each of the prepositions given.

9. Mention four prepositions that take the dative. Make a sentence containing each preposition given.

10. Decline, ich, du, er, sie, es.

11. Translate: He was here on Monday. They were in Switzerland on Sunday. His birthday was in January. We were at church on Friday. He is a doctor. Our brother is a merchant. We make windows of glass. Twice a year. Three times a week. Once a day.

12. Translate: The numerals 1-10, the ordinals 1st-10th. Write out in full, two times, five times, seven times, ten times.

[U. C.] GERMAN, JUNE, 1892.

LIMIT.—As for Lower Commercial, special attention to business letters in German.

1. Write in German (with the article) the nominative singular, genitive singular and nominative plural of painter, boy, sun, dog, flower, year, village, man, heart, neighbor, philosopher, wood, woman.

2. Decline in full in German: This beautiful child. Good water (singular only). That old house. Which young sister.

3. Give in German, in all the persons, the following tenses: I become. I shall praise. I have been loved. I should believe (singular only). I should have been sold (singular only).

4. Some German prepositions govern either the accusative or the dative. Explain briefly the difference in meaning. Give one example of each case and name the prepositions.

5. Give the principal parts of the following verbs with auxilliary in the passive: Loben, verschwenden, singen, bombardieren, sein, werden, leiden, auslachen, brennen.

Answer in order of questions.

Five per cent. bonus for neatness.

Leave margin and gap.

Number answers and divisions.

[L. C.] GEOGRAPHY, JUNE, 1892.

LIMIT.—The Physical Features and Political Geography of Canada, the United States and Europe.

1. Outline the Physical Features of Europe, as regards the Mountains, Minerals, Plains, Peninsulas, Capes, Islands, Coast waters, Rivers, Lakes, Climate, Vegetation, Industries. (Value 20.)

2. Give a full description of Canada, physically. (Value 10.)

3. Name the political divisions, with their capitals, of the Dominion. (5.)

4. What are the industries of commercial importance of the Dominion, and where are they carried on? (Value 10.)

5. Name, stating whence they come, the chief commodities which Canada imports from the United States. (Value 5.)

[U. C.] GEOGRAPHY, JUNE, 1892.

LIMIT.—As for Lower Commercial, Manufactures, Products, Exports, Imports, Commerce, of Europe, United States, Canada, West Indies.

1. What are the exports of the Dominion? whence are they sent? give an estimate of their yearly value. (Value 20.)

2. Indicate on a map the commercial routes of Canada—the Railways, Canals, Rivers and Lakes. (Value 15.)

3. Give some idea of commercial interchange between Canada and the United States. (Value 10.)

4. What European exports find a Canadian market? (Value 5.)

[L. C.] MENSURATION, JUNE, 1892.

LIMIT.—Involution, Evolution of Square and Cube Root, Measurement of Rectangular Parallelograms, Cubic Measure, Board Measure.

1. Find the Square Root of 82376, of $12\frac{1}{8}$, of 123.321.

2. Find the Cube Root of 6217354, and of 8694.9326.

3. A square field containing 160 acres is fenced at a cost of $10 a rod of fence; find the cost.

4. What will it cost to paper a room 20′ 9″ long, 16′ 3″ wide, and 15′ high with paper worth 75c. a roll—each roll is 18″ wide and 8 yards long?

5. Find the cost of digging a cellar 18′ 3″ by 14′ 9″ and 7′ 6″ deep @ $1.10 per cubic yard.

6. A piece of lead $3\frac{1}{4}$″ long, $2\frac{1}{3}$″ wide, and $2\frac{1}{5}$″ thick is beaten into a sheet 2′ long and $7\frac{1}{7}$″ wide; how thick is it?

7. How many feet of lumber will be required to build a sidewalk 375′ long and 4 wide out of 2″ planks? Under the walk are two stringers of 4″ × 4″ scantling.

8. Find the amount of the following bill of lumber:

3	pcs.	1 ″	×	10 ″,	12′	@	$17.00	per M.
10	"	$\frac{1}{2}$	×	8 ,	18	@	18.00	" "
6	"	$\frac{3}{4}$	×	$9\frac{1}{2}$,	24	@	13.00	" "
11	"	$1\frac{1}{4}$	×	8 ,	16	@	19.00	" "
3	"	$2\frac{3}{4}$	×	9 ,	9	@	11.00	" "

[U. C.] MENSURATION, JUNE, 1892.

LIMIT.— As for Lower Commercial, and the Measurement of Triangles, Circles, Cylinders, Ellipses, Cones, Pyramids, Spheres; Gauging.

Find the value of the following bill of lumber:

6	pcs.	1 ″	×	$8\frac{1}{2}$″,	12′	@	$17.00	per M.
3	"	$\frac{1}{2}$	×	$9\frac{1}{2}$,	24	@	18.00	" "
4	"	$\frac{1}{4}$	×	12 ,	16	@	22.00	" "
9	"	$1\frac{1}{2}$	×	8 ,	9	@	15.50	" "

2. A field three times as long as it is wide contains 30 acres; find the length of its diagonal in rods.

3. Find the area of the following triangles: (*a*) a right-angled triangle whose base is 40′ altitude 20′, (*b*) an equilateral triangle whose side is 90′, (*c*) an isosceles triangle whose base is 25′ and equal sides 30′, (*d*) a triangle whose sides are 36′, 40′ and 50′ respectively.

4. Find (*a*) the diameter, (*b*) the circumference of a circular acre. Answer in feet.

5. How many square feet of sheet iron will make a cylindrical smoke-stack 23′ high and 5′ in diameter?

6. How many gallons, quarts, pints, in a barrel that measures 28″ from the centre of the bung inside to the chine?

7. Find (*a*) the volume, (*b*) the surface of a sphere 9″ in diameter.

8. An elliptical vat whose diameters are 8′ and 6′ respectively contains 300 cubic feet; find its depth.

9. How many gallons in a cylindrical vat 18′ across and 2′ deep if a gallon contains 270.2 cubic inches?

10. A cone 16′ high is 5′ across at the base; find its cubic contents.

[L C.] ARITHMETIC, JUNE, 1892.

LIMIT.—Rapid and Accurate Computations in Simple Numbers, Fractions (vulgar and decimal), Interest (simple and compound), Discounts, Partial Payments, Invoicing.

1. The sales in a certain store were as follows:

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
1st week ..	123 07	63 98	146 13	27 90	118 74	296 19
2nd week....	93 44	89 00	94 63	91 75	88 34	191 93
3rd week....	127 92	93 46	126 37	67 27	98 87	273 61

Find (*a*) the weekly totals, (*b*) the average daily sales for each week, (*c*) the total sales for the three weeks, (*d*) the average daily sales for the three weeks.

2. Find in inches $\frac{3}{7}$ of a mile + .0125 of a rod − .081 of a foot.

3. Find the simple interest on $376.84 @ 6% January 8, 1889, to March 26, 1891.

4. Find the compound interest on $69.63 for 3 years and 73 days @ 7%.

5. Find the cash amount of the following invoice:

225 lbs.	sugar	@ 3 c.	cash disc.	$1\frac{1}{2}$%	=
127 "	tea	@ 43	" "	3 "	=
167 "	coffee	@ 21	" "	$2\frac{1}{2}$ "	=
296 "	soap	@ $4\frac{1}{2}$	" "	5 "	=
165 "	tobacco	@ 23	net		=

6. Toronto, January 3, 1889. On or before June 1st, 1892, I promise to pay James Jones, or order, ($500) five hundred dollars, with interest, at 8 per cent. W. Holmes. On the back of this note were the following partial payment endorsements:

September 11, 1890, received $128.00; James Jones.

March 13, 1891, received $245.00; James Jones.

How much is due to-day, July 4, 1892?

7. Toronto, January 30, 1891. Ninety days after date I promise to pay S. Brown, or order, two hundred and thirty-seven dollars and fifty cents. B. Black.

This note was discounted at the bank March 14, at 7%; find the proceeds.

8. Toronto, March 20, 1892. Sixty days after date I promise to pay M. Mason, or order, eight hundred dollars, with interest at 6%. J. Green.

This note was discounted at the bank on May 3, at 7%; find the proceeds.

[U.C.] ARITHMETIC, JUNE, 1892.

LIMIT.—As for Lower Commercial, Percentage, Commission, Exchange, Stocks and Bonds, Single and Double Averages, Use of Interest Tables.

1. A note dated June 4, 1891, for $375 00 to run 75 days with interest at 6% is discounted July 27 @ 7%; find the proceeds.

2. A note dated Jan. 7, 1890, for $1,000.00, payable on or before July 4th, 1892, with interest at 8%, bears the following partial payment endorsements: Sept. 1, 1890, $200.00; July 18, 1891, $300.00; find the amount payable July 4, 1892.

3. Find the gain or loss per cent. on each of the following transactions:—Bought apples at 3 for 2 cents and sold them at 2 for 3 cents; bought hats at $30.00 per dozen and sold them at $3.50 each; bought 30 barrels of apples @ $2.00 per barrel, gave 5 barrels away to friends and sold the rest at $2.25 per barrel.

4. Sent 1,000 barrels of flour to my agent in Montreal to sell at $4.75 per barrel. He is to deduct his commission of 2% and invest the balance, less another commission of 2% on the amount invested, in sugar at $12.00 per barrel; how many barrels of sugar does he buy for me?

5. Sterling Exchange is quoted to day at $\frac{1}{3}$; find how much Canadian money will buy a draft on London for £275, 10s.

6. Sold 300 shares of Bank of Hamilton stock, paying a dividend of 8%, at 134, and invested the proceeds in Ashbridge's Bay stock at 67, paying a dividend of 3%; find the difference in my income.

7. The following account appears in my Ledger, at what date should the balance begin to bear interest?

Dr.			James Jones.			Cr.
1891.			1891.			
Jany. 3,	To Mdse.....	$375 00	Feby. 11,	By Cash.....		$280 00
June 15,	"	483 00	July 17,	"		427 00

8. Construct an interest table for $1.00 at 5% and at 6% for 1 to 10 days.

9. Find the interest on the following deposit in the Toronto Savings Bank, interest at 4% compounded on the 1st of January each year:—

Oct. 15th, 1889, deposited $400.00; withdrew principal and interest Jan'y 1st, 1892.

10. A sold a horse to B for $200.00 gaining 25%; B sold it to C losing 25%; C sold it to D gaining 25%; what did A, C and D pay?

[L.C.] Penmanship, June, 1892.

Limit.—Theoretical penmanship; a graceful, legible business hand.

1. Describe briefly, giving reason, (*a*) the relative position of the writer and his work; (*b*) proper holding of pen; (*c*) what in your opinion are the difficult features to be acquired? (12.)

2. Explain, with full line illustrations (*a*) slant; (*b*) fore-arm movement; (*c*) whole arm movement. (9.)

3. Write each of the following small letters six times: *b*, *c*, *e*, *f*, *k*, *p*, *r*, *s*, *w*, *x*, thus: *aaaaaa*, *bbbbbb*, etc., and one line Ovals, one line reverse Ovals. (9.)

4. Write the first verse of "God Save the Queen." (10.)

5. In a diagram representing an envelope address a letter to William H. Messenger, Esq, No. 137 Fleet St., London, England. (10.)

6. The examiner, as a practical test of legibility, style and speed, will dictate a passage of 100 words in 5 minutes, and immediately take up the paper. (100.)

[U.C.] Penmanship, June, 1892.

Limit.—As for Lower Commercial; Ornamental Penmanship.

1. Writing once across the page illustrate (*a*) slant, (*b*) fore-arm movement, (*c*) sliding movement, (*d*) whole arm movement. (4.)

2. Write all the capitals, each five times, as *AAAAA*, etc. (13.)

3. Write as in No. 2, joining each group, the small letters: *b*, *c*, *e*, *f*, *k*, *p*, *r*, *s*, *v*, *w*, *x*, *z*. (12.)

4. In a diagram representing an envelope address a letter to William H. Messenger, Esq., No. 137, Fleet St., London, England. (5.)

5. Write the first verse of "God Save the Queen." (6.)

6. Write some useful ornamental design. (10.)

7. The examiner, as a practical test of legibility, style and speed, will dictate a passage of 100 words in five minutes and immediately take up the paper. (100.)

[L.C.] PHONOGRAPHY, JUNE, 1892.

LIMIT.—A thorough knowledge of the subject as laid down in Isaac Pitman's Teacher; ability to write accurately at a rate of 50 words per minute.

1. Make an alphabetical list of Grammalogues, longhand and shorthand, as given in the Teacher. (Value 30—2 for each error.)

2. Write in shorthand and fully vocalize the following words—give both the longhand and shorthand:

sweetly,	Toronto,	charming,	necessary,	succeeding,
silversmith,	forming,	occasionally,	escape,	excellent,
Ontario,	bitterly,	science,	chosen,	drawing.

(30, less 2 for each error.)

3. A letter or other selection containing 500 words will be chosen by the examiner and read at the rate of 50 words per minute. 30 minutes will be allowed to reproduce it in longhand from the shorthand notes. (Value 40, less 2 for each error or omission.)

[U.C.] PHONOGRAPHY, JUNE, 1892.

LIMIT.—The subject as taught in Isaac Pitman's Manual and Reporter; to write 100 words per minute and reproduce correctly in longhand.

1. Make an alphabetical list, longhand and shorthand, of the Reporting Grammalogues. (30, less 1 for each error or omission.)

2. Write the following, unvocalized words, correct as to position and outline:

anything,	philosopher,	altogether,	immediately,	manuscripts,
commercial,	instrument,	patient.	whenever,	representative,
interest,	influenced,	reformation,	inability,	parliamentary,
architect,	publication,	remembers,	whatever,	similarity.

3. A letter or other selection containing 500 words will be chosen by the examiner and read at the rate of 100 words per minute. Thirty minutes will then be allowed to reproduce it in longhand correct as to points, capitals and spelling. (Value 50, less 2 for each error or omission.)

[L.C.] HISTORY, JUNE, 1892.

LIMIT.—General view of English and Canadian History.

1. What services did Champlain render Canada? Show the importance of his rule. (5.)

2. Explain the causes of the slow progress of Canada under French regime. (5.)

3. Name, giving dates of each, the French governing officials of Canada. (3.)

4. Outline the rule of Frontenac, showing his weakness and his strength in developing an ideal national life. (5.)

5. Under what circumstances was the Constitutional Act of 1791 passed? state its clauses and point out its defects. (5.)

6. Write explanatory notes on the Family Compact, Clergy Reserves, Canada Trade Act. (19,)

7. Taking a general view of English history from the Roman Invasion, B. C. 55, to the present time; set forth some of the leading events that mark out the lines of progress socially, politically, commercially, that have made the British nation what it is to-day. (15.)

[U.C.] HISTORY, JUNE, 1892.

LIMIT.—English and Canadian History, Municipal Institutions.

1. Outline the plan of the Campaign ending in the English capturing Canada. (10)

2. What causes provoked the War of 1812 13-14, and why were the Americans unsuccessful in their attempts to conquer Canada? (10.)

3. How are we governed? Explain fully the Parliamentary, Judicial and Municipal systems. (15.)

4. From a general view of English History from the Roman Invasion, B.C. 55, to the present time, set forth some of the leading events that mark out the lines of progress, socially, politically and commercially, that have made the British nation what it is to-day. (15.)

[L.C.] GRAMMAR, JUNE, 1892.

LIMIT.—High School Grammar, practical English, right use of words.

1. What is the difference between the term "word" and "part of speech?" (5.)

2. Sentences are classed as "Assertive," "Interrogative," "Imperative." On what basis is this classification? Illustrate from the "Lord of Burleigh." (6.)

3. What is meant by "good English?" (5.)

4. How is the use of "good English" to be acquired most rapidly and satisfactorily? (5.)

5. What advantage have compound and complex sentences over simple primary; Illustrate from "The Cloud." (5.)

6. Show the practical importance of a thorough knowledge of "Grammatical Analysis." Analyse Stanza II. of "The Cloud," separating each sentence into subject and predicate only; state the relation each sentence has. (10.)

7. What are the advantages of giving different grammatical values to the same word? Illustrate with five different words. (5.)

8. Correct, giving your reasons, anything you consider wong in the following: (*a*) A number of boys was present; (*b*) London has a larger population than any city in the world; (*c*) They wanted to know if they could not have a holiday; (*d*) Both the President and Secretary have resigned; (*e*) To this cause, no doubt, is due most of his failures. (10.)

[U. C.] GRAMMAR, JUNE, 1892.

LIMIT.—As for Lower Commercial, but more thoroughness required.

1. Define Conjugation; distinguish the Conjugation of English verbs. Conjugate deal, fly, flee, flow, hide, loose. (8.)

2. Form sentences illustrating the rules: (*a*) The finite verb must agree with its subject in number and person; (*b*) The verb "To be" takes the same case after it as it has before it; (*c*) The relative pronoun agrees with its antecedent in gender and number. (12.)

3. Analyse Stanza II. of "The Cloud," separating each sentence into subject and predicate and stating in what relation each sentence is used. (10.)

4. Explain the Passive Voice contrasting it with the Active; state any advantage the former has over the latter. (10.)

5. Correct, giving your reasons, anything that in your opinion is wrong in: (*a*) He saw musquitoes climb the trees and bark; (*b*) Whom do you take it to be? (*c*) Always walk on the coolest side of the street; (*d*) Gold is the heaviest of all metals; (*e*) From learning springs all noble things. (10.)

[L C.] TYPEWRITING, JUNE, 1892.

LIMIT.—The mechanism and proper management of the machine; practical application of the rules for points and capitals; correct spelling and tasteful arrangement of work; correct copying from longhand or shorthand at 30 words per minute.

1. Give a specimen of your idea of neat and accurate work. Time to produce, 30 minutes. (50.)

2. Write a letter (to be selected by the Examiner from Payne's Business Letter Writer) containing 150 words. Time allowed to copy, 5 minutes. (Value 50, less 1 mark for each error or unwritten word.)

[U. C.] TYPEWRITING, JUNE, 1892.

LIMIT.—As for Lower Commercial, and business letters and papers to dictation, correct as to points, capitals and arrangement, at 40 words per minute.

1. Write a specimen, of neat, plain or tabular work. Time to produce, 30 minutes. (Value 50.)

2. Write to dictation a business letter, correct as to form, points, capitals and spelling. (Letter to be selected by the Examiner from Payne's Business Letter Writer, to contain 200 words, to be read at 40 words per minute.) Time, 5 minutes. (Value 50, less 1 for each error or omission.)

[L. C.] PRACTICAL GEOMETRY, JUNE, 1892.

LIMIT.—First half of Art School Course. Write out the construction of all cases.

1. To erect a perpendicular to a given line, AB, from a point C within it. (2.)

2. A wishes to make a "drawing board" $1\frac{1}{2}'$x2′ with square corners. Show by a drawing how he can do this without using a square. Scale ($1'' = 1'$.) (3.)

3. To draw a line parallel to a given line, AB, at a given distance, C, for it. (3.)

4. Draw two oblique lines $1\frac{1}{4}''$ long forming a right angle, and at a distance of $1''$ draw a line parallel to each of them. (3.)

5. Divide a given line AB into N equal parts. (1.)

6. A. is setting out cabbage plants, 17 plants in every 20′, show how far they are apart. (Scale $\frac{1}{8}'' = 1'$.) (4.)

7. A. is told to plant 17 trees so that 16 of them shall be equal distances apart and 16′ from the 17th tree. Show on a scale of $\frac{1}{16}''$ to a foot the relative positions of the trees. (3.)

8. Construct a semicircular protractor, radius 2″, without using any protractor. (7.)

9. Construct an equilateral triangle of a given altitude, A. (3)

10. A. is standing opposite a point 5′ from the end of a wall which is 20′ long, and 15′ from its nearest extremity. Represent his position by a point and the wall by a line, and find out how far he is from the more distant end of the wall. (Scale $1'' = 10'$.) Value 7.)

11. On a given line AB construct an isosceles triangle having a given vertical angle. (3.)

12. On a given line AB construct a regular pentagon. (5.)

13. A boy 3′ 6″ high stands 24′ from the foot of a tree and finds that a line from his eye at an angle of 72 degrees with the horizontal line exactly reaches the top; find the height of the tree. (Scale 1″=16′.) (Value 7.)

[U. C.] PRACTICAL GEOMETRY, JUNE, 1892.

LIMIT.—The Art School Course. Write out the construction in all cases.

1. Draw a tangent to a circle from a point *B* in the circumference. (Value 5.)

2. To draw a tangent to a circle from a point, *A*, without it. (Value 3.)

3. A string is stretched tightly around a cylinder 1′ 1″ in diameter and a rod $1\frac{1}{2}$′ from it and parallel to its axis. Show the point where the string first touches the surface of the cylinder. (Scale 1″=1′.) (Value 7.)

4. Construct a pentagon whose sides are $1\frac{1}{4}$ in. long. (10.)

5. Within a given circle, *CHG*, inscribe a regular octagon. (5.)

6. An ellipse being given, to find the transverse and conjugate axes. (5.)

7. To draw a circle of a given radius *A*, to touch both lines of an angle, *BCD*. (1.)

8. About a given circle, *ABC*, to construct an equilateral triangle. (5.)

9. Within a given square, *ABCD*, to construct a regular octagon. (5.)

10. A sphere $1\frac{1}{4}$″ in diameter is dropped into a hollow cone having a vertical angle of 50 degrees and its axis 3″ long; how near could the centre of the sphere approach to the vertex of the cone? (7.)

11. To find a mean proportional between two given lines, *A* and *B*. (3.)

12. A. has a field 100′ by 500′ and exchanges it for a square field of the same area. What is the length of its side? (Scale 200′=1″.) (Value 7.)

[L. C.] LINEAR PERSPECTIVE, JUNE, 1892.

LIMIT.—First half of the Art School Course.

1. By a diagram explain the method of measuring lengths (*a*) at right angles; (*b*) not at right angles—to the picture plane. (10.)

2. Represents a hall 7 feet wide, 9′ high, 15′ long, paved with squares 1′ to a side—half of the squares black. Height 5′, distance 5′, opposite the centre; scale $\frac{1}{2}$′=1″. (5.)

3. Represent three glass cubes, 3′ side, the nearest edge being 6′ to the left, on the ground plane, No. 1 at P.P., No. 2 5′ back, No. 3, 10 ft. back. Height 5′; distance 10′; scale $\frac{1}{2}$′=1′. (5.)

4. Draw 9 glass cubes to illustrate the 9 positions in which an object parallel to the P.P. may be placed; judge your own measurements.

5. Represent in perspective two squares of 4′ side, their planes being parallel to each other and to the ground plane, and two sides of each being parallel to the P.P. The centre of one square is 1′ from the ground plane, 1′ to the right, 4′ back, and the centre of the other square is vertically above this point at a distance of 1′. (Scale $\frac{1}{2}$″=1′; height 3′; distance 8′). (5.)

6. Place in perspective a circle of 8′ diameter, its plane being perpendicular to the P.P. and inclined upwards to the right at an angle of 60 degrees with the ground plane. The diameter parallel to the P.P. touches the G.P. in a point 3′ to the right and 6′ back. (Scale $\frac{1}{4}$″=1″; distance 10′; height 6′). (5.)

7. Draw 3 doors each 3″x2″x$\frac{1}{8}$″, in door frames $3\frac{1}{2}$″x3″x$\frac{1}{4}$″. No. 1 closed, No. 2 open towards you, No. 3 open from you. (10.)

[U.C.] LINEAR PERSPECTIVE, JULY, 1892.

LIMIT.—As for Lower Commercial and the second half of the Art School Course.

1. By a diagram explain the methods of measuring, in perspective, lengths on lines
   (I.) At right angles to P.P.
   (II.) Not at " " (Value 10.)

2. Place in perspective a circle 8′ in diameter, its plane being perpendicular to the P.P. and inclined upwards to the right at an angle of 60° with the ground plane. The diameter parallel to the P.P. touches the ground in a point 3′ to the right and 6′ from the P.P. Height, 6′; distance, 10′; scale, $\frac{1}{4}''=1'$. (Value 5.)

3. Place in perspective a hexagon 2′ 6″ to a side, when perpendicular to the ground plane, two of its sides being perpendicular to the picture plane, its centre 2′ to the left, 3′ back from the picture plane, and 2′ to 6″ above the ground plane. (Value 10.)

4. Show the hexagon of Q 3 when its plane is perpendicular to the picture plane and ground plane, two of its sides are perpendicular to the picture plane and its centre is 4′ to the right, 3′ from the P.P. and 2′ 6″ above the G.P. Join the corresponding edges of these two hexagons and so get a hexagonal prism. (Value 10.)

5. Place in perspective a flight of 5 steps, each one of which is 5′ 6″ long, 11″ high, 22″ wide. The front face of each step is parallel to and facing the picture plane, and the near right hand corners of the lowest step are 9′ 3″ to the right and 2′ 9″ beyond the picture plane. Height, 6′ 6″; distance, 13′; Scale, $\frac{1}{4}''=1'$. (Value 10.)

6. Place in perspective a rectangular block $2' \times 4' \times 6'$ resting on one of its largest faces, the long edges of which retire towards the left at an angle of 45° with the P.P. The nearest corner is 2′ 6″ to the left and 1 foot back. Height, 3′; distance, 7′; scale, $\frac{1}{2}'=1'$. (Value 5.)

III. REGULATIONS RESPECTING UPPER CANADA COLLEGE.

1. The staff of the College shall consist of: (1) The Principal, (2) one Master in each of the following subjects, viz., Classics, Modern languages, Mathematics, Science, and Commercial subjects, (3) such other masters as may be required from time to time, and (4) Special Instructors in Drawing, Music, Gymnastics and Military Drill.

2. Every master on the College staff shall be considered as contracting for an indefinite term of years provided always that such contract may cease at any time, on three months notice in writing by either party to the contract.

3. There shall be three terms in the scholastic year, viz: the Autumn term extending from the 10th of September to the Christmas Holidays; the Winter term from the Christmas Holidays to the Easter Holidays; the Summer term from the Easter Holidays to the 10th day of July.

4. The text-books authorized by the Education Department for use in Public and High Schools shall be the authorized text-books of the College.

5. If the fee is paid during the first week of pupil's attendance the rate per term will be for one *Day pupil* $20; for *two* brothers $18, and for *three* brothers $16 per term; and for *Boarders* the rate per term will be for *one* pupil $80; for *two* brothers $75, and for *three* brothers $70.

If not paid within twenty days from the opening of the term the College Fees for *one Day pupil* shall be $75 a year or $25 a term; for *two* brothers $66 a year or $22 a term; for *three* brothers $60 a year or $20 a term. Fees for *Boarders* $300 per year or $100 a term; for *two* brothers each $95; for *three* brothers $90.

6. An abatement of $4 a week shall be allowed resident boys for absence through illness for any period exceeding four weeks. Boys may be admitted at any time during the term, and when so admitted shall be charged proportionately. There shall be no abatement in the fees of day pupils for absence.

7. The Principal shall be responsible for the care of College property, and shall report to the Chairman of the Board of Trustees any repairs or alterations that may be required. Any expenditure upon grounds or buildings shall be made on the authority of the Board of Trustees under the direction of the principal.

8. A written examination for the admission and promotion of pupils shall be held by the Principal at such times as he may deem expedient, provided always that the standard for admission to the Third Form shall be at least equal to that required for entrance to High Schools and Collegiate Institutes.

9 Every boy in residence shall attend religious service at least once on Sunday at such church as his parent or guardian may require. Provision shall be made by the Principal for additional religious instruction in the Sacred Scriptures on Sunday, by such members of the staff or by such other persons as he may designate for that purpose, provided always that no boy shall be required to attend any church or religious exercise from which he has been excused in writing by his parent or guardian.

10. On the application of any clergyman for the purpose of giving religious instruction to the boys of his own denomination during the week, the Principal shall make such arrangements for that object as may be deemed necessary.

11. The College shall be opened and closed each day according to the Regulations of the Education Department for Public and High Schools.

12. The authority of the Principal in the organization and discipline of the College shall correspond as near as may be to the authority of the Head Master of a High School under the High School Act and Regulations of the Education Department.

13. The course of study shall include the work prescribed for the Fourth Form of the Public Schools of the Province, and the whole of the course prescribed for High Schools and Collegiate Institutes, and shall be subdivided into six Forms.

14 Beginning with the Third Form the course shall be subdivided so as to provide for an option between preparation for matriculation into the University of Toronto, and the School of Practical Science, or for admission to the learned professions; and preparation for the civil or military service, or commercial pursuits. These two courses shall extend over a period of four and two years respectively.

15. The course of study in the different forms shall be limited as follows :—

First Form.

Latin :—Grammar to the end of the regular Conjugations; exercises therein in Translation and Composition.

French :—

Pronunciation and Oral Exercises.

H. S. French Grammar: Lessons 1-10.

English :—Public School Grammar (Parts I. and II.), Composition, Dictation.

Literature :—Fourth Reader (Public Schools).

History and Geography :—Public School History of England and Canada. Chapters I to VIII. Canadian History, Chapters I.-VIII. Geography of the Dominion of Canada and United States. General knowledge of the maps of the world.

Arithmetic :—Vulgar Fractions ; Mental Arithmetic.

Penmanship :—Upper Canada College Headlines.

Drawing :—Elementary freehand drawing from dictation and from flat examples.

Military Drill and Gymnastics.

Music.

SECOND FORM.

Latin :—Grammar to the end of the Irregular Verbs.; exercises in translation and composition.

Greek:—Regular nouns, adjectives, personal pronouns, and active indicative of verbs in—*a*.

French :—
Pronunciation and Oral Exercises.
H. S. French Grammar—Lessons 1-17.

English :—
Public School Grammar.
Composition.—Narrative ; letter writing ; dictation.

Literature :—Fourth Reader (Public Schools.)

History and Geography :—Public School History of England and Canada, Chapters I. to XXII, inclusive, and Chaps. I. to VI. of Canadian History) ; Geography of the Dominion of Canada, United States and General Geography of other Countries of the world.

Arithmetic :—Compound Rules and Simple Vulgar and Decimal Fractions : Mental Arithmetic.

Algebra :—Simple rules.

Penmanship :—Principles of writing.

Drawing :—Freehand from flat examples and practical examples.

Military Drill and Gymnastics.

Music.

THIRD FORM.

Latin :—
Accidence and the prominent rules of Syntax ; Translation of one of the prose authors prescribed for pass junior matriculation ;
Latin Prose Composition.

Greek :—
Grammar to the end of the Regular Verbs ; Selections from the exercises therein in Translation and Composition.

French :—
Oral Exercises, Conversation, Dictation, etc.
High School French Grammar ; Part II.
High School French Reader.

German :—

Declension of Substantives and Adjectives.
Auxiliary Verbs (not including model auxiliaries) and example of weak and strong verbs—Pronouns.
Order of words in the German sentence.
High School German Grammar—Lessons 1-15.

English :—

High School Grammar.
Composition—Narrative ; Paraphrasing ; Letter Writing ; Dictation.

Literature :—High School Reader.

History and Geography :
History of England and Canada. Minute Geography of Europe and North America and the General Geography of the Continents.

Mathematics :—Arithmetic ; Fractions (Vulgar and Decimal), Problems involving same.
Algebra.—Factors, G.C.M., and L.C.M.
Euclid.—Book I. (1-26) and Deductions.

Botany.

Hygiene.

Penmanship :—Business Forms.

Drawing :—Freehand ; Practical Geometry perspective.

Military Drill and Gymnastics.

Music.

The obligatory subjects of this form are Latin, English, Literature, History and Geography, Mathematics and Penmanship, Drawing, Military Drill and Music. An option is allowed between Greek, and French and German.

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Lower Commercial Form.

Reading :—The High School Reader.

Writing :—Business Penmanship.

Spelling :—High School Reader and everyday words.

Literature :—High School Reader—selected passages.

Grammar :—High School Grammar—Practical English.

Composition :—Reports, letters, circulars, advertisements, use of capitals and points.

Elocution :—Readings, recitations, debates.

History :—General view of English and Canadian History.

Geography :—Physical and Political Geography of Europe, United States and Canada.

Arithmetic :—High School Arithmetic, Fractions, Interest, Discount, Partial payments, Invoicing.

Mensuration :—Involution, Square and Cube Root, parallelograms, board measure, Cubic measure.

Algebra :—Simple Rules, Factoring.

Practical Geometry :—First half of Art School Course.

Lineal Perspective :—First half of Art School Course.

Book-keeping :—Single Entry Retail, Double Entry Retail and Wholesale.

Banking :—Routine of deposit and withdrawal, duties as Teller and Ledger Keeper.

Commercial Law :—Commercial terms and usages, the law of contracts and negotiable paper, business forms.

Indexing and Precis :—Summaries, transcriptions, filing business papers.

Phonography :—Isaac Pitman's Teacher—speed 50 words per minute. Optional.

Typewriting :—Remington—business letters from copy—30 words per minute. Optional.

Modern Languages :—French or German. (Same as Third Form.)

Upper Commercial Form.

Reading :—Financial, Commercial and news column of a daily paper.

Writing :—Plain and ornamental penmanship.

Spelling :—Everyday words, commercial terms, with meanings.

Literature :—High School Reader—selected passages.

Grammar :—High School Grammar, practical English, right use of words.

Composition :—Business letters, reports of meetings, minutes, capitals and points.

Elocution :—Readings, recitations, debates, public meetings.

History :—English and Canadian, Canadian municipal institutions.

Geography :—Commercial geography—exports, imports, products, commerce of Europe, United States, and Canada.

Arithmetic :—Percentage, commission, exchange, stocks, bonds, single and double average, interest tables.

Mensuration :—Measurement of triangles, circles, cylinders, ellipses, cones, pyramids, spheres, gauging.

Algebra :—Simple equations of two quantities, easy quadratics.

Practical Geometry :—The Art School Course.

Linear Perspective :—The Art School Course.

Bookkeeping :—Manufacturing, commission, steamboating, railroading, joint stock company.

Banking :—Discounting, collecting, protesting, exchange, clearing house.

Commercial Law :—Partnerships, agency, customs duties, liabilities of companies.

Indexing and Precis :—As required for Civil Service examinations.

Phonography :—Isaac Pitman's Reporter—speed 100 words per minute to dictation of business letters, statements, etc. Optional.

Typewriting :—Remington—business letters and papers to dictation, correct as to points and capitals. 40 words per minute. Optional.

Modern Languages :—French or German.

FOURTH FORM.

Classics :—

Latin—Accidence and Syntax; translation of the second book of the prose author for Junior Matriculation, and part of the books of the poetical author.

Bradley's Arnold's Latin Prose Composition, Ex. 1-12.

Greek—Accidence and the prominent rules of Syntax; translation of half of the book of the prose author required for Junior Matriculation.

Abbott's Arnold's Greek Prose Composition (1-10) § 10 inclusive.

Mathematics :—

Euclid—Books I. and II. and deductions to end of Simple Equations.

Algebra.

Arithmetic—Commercial Arithmetic.

Mensuration :—

Areas of rectilinear figures and volumes of right parallelopipeds and prisms; the circle, sphere, cylinder and cone.

History and Geography :—

History of Rome from the commencement of the Second Punic War to the death of Augustus.

Outlines of the History of England and Canada.

General Review of H. S. Geography.

Ancient Geography—Italia, Græcia and Asia Minor.

English :—

High School Grammar—One of the poetical texts prescribed for matriculation ; composition—sentence and paragraph structure.

French :—

Oral Exercises : Conversation, Dictation, etc.

Translation of easy sentences into French. H. S. Grammar.

High School French Reader.

German :—

Oral Exercises : Pronunciation, Dictation, Grammar.

Easy readings in prose.

High School German Grammar, Lessons 1-25.

Bernhardt's Novellen (Bond II).

Penmanship :— Business Forms continued.

Book-keeping :—Theoretical and Practical—Précis Writing ; business letters.

Physics :—High School Physics.

Chemistry :—High School Chemistry.

Botany :—High School Botany.

The obligatory subjects of the Fourth Form are Latin, Mathematics, History and Geography, English, Penmanship and Book-keeping, and one of the following groups :—

(*a*) Greek.

(*b*) French and German.

(*c*) French or German with Physics or Chemistry or Botany.

FORMS V. AND VI.

16. The Course of Study for Forms V and VI shall be the same as is prescribed for Pass and Honor Matriculation respectively by University of Toronto.

DUTIES OF PRINCIPAL.

17. It shall be the duty of the Principal—

1. To appoint some member of the staff Dean of residence.
2. To promote boys from one Form to another after examination.
3. To report for Exhibitions such boys as have passed the prescribed examination.
4. To assign to masters, officers or servants their respective duties.

5. To suspend any master, officer or servant for any neglect of duty or other impropriety, and to report the same to the Board of Trustees forthwith.

6. To report to the Board of Trustees at the close of each term—

(*a*) The number of pupils in attendance, distinguishing between residents and day pupils.

(*b*) The amount received from pupils for ordinary fees.

(*c*) Amounts received from other sources.

(*d*) Fees unpaid, if any.

7. To submit to the Board of Trustees, at the last regular meeting in each year, an estimate of the supplies required for the residence for the next ensuing year. A statement showing the expenditure of the previous year, with all accounts, vouchers and papers relating to the same shall be submitted at the first regular meeting in September.

Duties of Masters.

18. It shall be the duty of the Masters—

(1) To make themselves acquainted with such parts of the Regulations of the Education Department, and of the Board of Trustees, as affect their respective duties.

(2) To be in their respective class rooms at least five minutes before the time fixed for the assembling of the classes, and to perform such duties at the opening and closing as may be required by the Principal.

(3) To take proper care of the furniture and all the appliances of the College.

(4) To teach the subjects assigned to them with due diligence and efficiency, and maintain order without severity or harshness.

(5) To attend meetings of the staff called by the Principal, to take charge of halls and grounds, to keep the records of the school, to perform any duties in connection with the boarding house or houses, the Sunday supervision of the boys either at church or in the residence, to assist the boys during the study hours, and generally to perform any duty that, in the opinion of the Principal, is necessary for the efficiency of the College.

The Bursar.

19. It shall be the duty of the Bursar—

(1) To preserve all books and papers placed under his care.

(2) To receive all moneys accruing from the endowment fund, from fees and from other sources of income, and to pay all accounts for salaries or for any other expenditure on the order of the Principal and the Minister of Education.

(3) To discharge such other duties as may be directed by the Board of Trustees.

Exhibitions.

20. There shall be one exhibition in each of the Departments of Classics, Mathematics, Modern Languages and Science and general proficiency in the 4th and 5th Forms respectively. The holder of an Exhibition shall be entitled to free tuition for the year next ensuing the holding of the same. The Examiners for Exhibitions shall be appointed by the Principal.

21. The Trustees of the College shall meet regularly at 3 o'clock on the Friday following the opening of each term. Special meetings may be held at any time on the call of the Chairman.

22. All statutes, rules and ordinances of the College inconsistent with the foregoing are hereby repealed.

The following regulations have been prescribed by the Principal and approved by the Trustees :—

23. *The Dean of Residence* :

1. He shall direct the duties of

(*a*) *The Resident Masters.*
(*b*) *The Matron.*
(*c*) *The Steward* and all other servants in the boarding houses.
(*d*) *The Sergeant of the play grounds*, while on duty.

2. He shall exercise a minute supervision over the general conduct and demeanor of the boys in residence, and over others connected with the boarding houses.

3. He shall see that the resident masters exercise a careful supervision over the boys under their care, that they check promptly anything contrary to good manners or social usages among them, and that the study masters give proper attention to the methods pursued by boys in preparing their lessons.

24. *Resident Masters* :

1. They shall exercise such supervision over the resident boys, as may best conduce to good order and discipline.

2. At least two of the resident masters shall always be on duty.

25. *Time Table*:

The following school time table shall be considered binding.

9 20 to 9.30 a.m.	Roll Call and Prayers.
9.30 to 12.30 a.m	Classes.
12.30 to 1 p.m.	Lunch.
1 to 2.30 p.m.	Classes.
2.30 to 3.30 p.m.	Extra and Detention Classes.

26. *The Matron*:

1. She shall look after the boys' wardrobes and rooms, superintend the housemaids while at work, look after sick boys and aid the Dean in promoting their comfort, and in carrying out the directions of the College physician.

2. She shall hire the housemaids, subject to the approval of the Principal, at wages fixed by the Board of Trustees.

3. She shall keep an inventory of all College property in the rooms in her department.

27. *The Steward*:

1. He shall have charge of the kitchen, dining and laundry departments and shall have charge of all stores, and inspect them on delivery.

2. He shall enter in a book, kept for that purpose, all expenditures in his department, and he shall submit his book every week to the Dean or Principal for examination.

3. He shall act as caretaker of "*The House*" and shall attend to minor repairs therein during the holidays.

4. He shall have immediate charge of the servants in his department, the cook, the kitchen and laundry maids, and the housemaids while waiting on table.

5. He shall inspect the houses and report to the Dean any repairs needed therein, and the manner in which the servants discharge their respective duties.

6. He shall hire the servants, in his department, subject to the approval of the Principal, at wages previously agreed upon by the Board of Trustees.

7. He shall keep an inventory of all college property in the house, and report on its conditions from time to time.

RULES OF THE COLLEGE RESIDENCES.

1. No boy in residence shall absent himself from study or from meals except for sickness or other urgent cause.

2. No boy in residence shall leave the grounds from Monday to Saturday, whose name has not been entered in the "*leave book*" by the Dean.

3. Extra leave, from 3.15 to 7.20, may be granted by the Dean or, after 3 p.m., by the afternoon masters on duty, but only at the request of parents or guardians.

4. Extra leave may be granted from study time on Saturday up to 9.30 p.m. and on Sunday, by the Dean at the request of parents.

5. All boys in residence have leave on Saturday and Sunday from dinner-time to tea-time, and Senior boys (boys in Forms VI., V., IV. and III.) shall be allowed to attend Divine service on Sunday evenings.

6. All boarders may accept invitations for Saturday and Sunday, but each boy's name must be entered in the invitation book.

7. Outer doors are locked on Saturday at 9.30 p.m., for juniors, and at 10.30 for seniors; on Sunday at 9.30 p.m.

8. No boy in residence, except for very urgent cause, shall absent himself from College after holidays are ended.

9. All boys in residence shall be guided by the time-table;—*Monday to Saturday*:

7.20.—Rise and dress.
7.50.—Breakfast.
8.10 to 8.45.—Study.
12.30.—Lunch.
6.00.—Dinner.
7.10 to 9.30.—Study (Monday to Friday); Saturday, 9 to 10.30 a.m.
10.30 p.m.—Lights out.
Sunday:—9.30 to 10.30, Sunday School.
Sunday:—9.30 to 10.30, Divine Service.

The masters on duty shall not leave the boarding house after 10.30 p.m. under any circumstances.

COPY OF A MINUTE OF THE EDUCATION DEPARTMENT, DATED 31ST DAY OF AUGUST, A.D., 1892.

Upon consideration of a report of the Honourable the Minister of Education, dated the 31st day of August, A.D., 1892, the Department of Education doth hereby order that the annexed regulations respecting Upper Canada College be approved of.

Certified,

(Sgd) J. R. CARTWRIGHT,
Clerk Executive Council.

UPPER CANADA COLLEGE.

Statement showing Receipts from Income on Investments and Expenditure chargeable thereto, from 1st July 1891, to 20th June 1892, inclusive.

Receipts.	$ c.	$ c.	Expenditure.	$ c.	$ c.
Interest on mortgages	5,012 53		Valuation fees, *re* lots for sale in Townships of Seymour and Walford	74 50	
Interest on debentures $3,875 09			Law costs, *re* sales of Coates and Parker Farms, Pye Farms, and lots in Township of Seymour $458 94		
Less commission charged by bank for collection of debentures and coupons $11 27	3,863 82		Less amounts repaid by purchasers, etc. 338 30	120 64	
Interest on purchase money, sales of land	137 15		Commissions on loans	15 00	
Rents	40 00		Insurance *re* mortgages $71 45		
Transfer Fees (*re* conveyances and transfers of land)	6 00		Less amounts repaid 56 05	15 40	
In Deposit: W. H. Rudolph, Loan. Amount of insurance on barn destroyed by fire, applicable towards interest on loan	108 00		Interest on bank account	10,738 75	
	$9,167 50		Share of expenses of Bursar's office	1,090 03	
Accrued and accruing interest on debentures	1,468 00				
Accrued and accruing interest on mortgages, to 30th June 1892	2,759 63				
		$13,395 13			$12,054 32
Add 4½ years rent of Bursar's office credited in the University books to be transferred by direction of the Minister of Education		1,800 00			
		$15,195 13			

No. 1.

UPPER CANADA COLLEGE.

THE BURSAR'S STATEMENT of Receipts and Expenditure for the Year ending 30th June, 1892.

Receipts.			To whom Paid	Service.	(Payment to Officer.	Reserved for R.F.	
		$ c.			$ c.	$ c.	$ c.
Tuition fees	$12,212 00			Salaries, and reservations therefrom for Retirement Fund, (not including salaries for July, 1891, which were paid in the previous June).			
Less returned to J. A. McKay for J.B. McKay, amount over paid by him	$10 00		Authority.				
Less fees of Hett & Kingsford, the cheque for which was dishonoured at bank	39 00		George Dickson	O. C.	Principal and 1st English Master	2,285 84	97 50
	49 00		W. S. Jackson	"	Dean and 1st Classical Master	1,297 91	43 75
		12,163 00	J. B. Sparling	"	1st Mathematical Master	1,334 58	43 75
Residence fees	$31,913 95		A. H. Young	"	French and German Master	1,306 25	43 75
Less rebates to—			A. Y. Scott	"	Science Master	529 18	12 50
W. E. Kay	$ 7 50		G. W. Johnson	"	Commercial Master	1,143 75	43 75
T. J. Mill	35 00		A. A. Macdonald	"	2nd Classical Master	967 50	32 50
A. R. J. McBean	36 00		D. Hull	"	2nd Mathematical Master	1,042 50	32 50
H. S. Hees	36 00		S. B. Leacock	"	2nd Modern Language Master	1,025 83	32 50
T. R. Wood	28 00		W. Allan Neilson	"	Assistant English Master	646 68	20 00
Less fees of S. & F. P. Hett, cheque dishonored at bank	136 00		A. D. Passmore	"	Assistant Classical Master	646 28	20 00
	278 50		E. H. Carpenter	"	2nd Commercial Master	356 25	18 75
		31,635 45	R. Holmes	"	Drawing Master	356 67	10 00
Shorthand and typewriting fees		390 00	W. Elliott Haslam	"	Music Master	150 00	
Omnibus fees		174 00	Rev. F. W. Terry	"	General Assistant Master	360 00	15 00
Medical fees	$493 00		W. Allan	"	" " " (temporary)	128 33	
Less fees of S. & F. P. Hett, cheque dishonored	2 00		H. J. Campbell	"	" " " "	50 00	
		491 00	W. Wedd	"	Former 1st Classical Master (salary for Aug., 1891, only)	108 33	
Carried forward		44,853 45	H. Brock	"	Former Assistant English Master (salary for Aug., 1891, only)	65 83	
			J. Blackstock	"	Former 2nd Modern Language Master (salary for Aug., 1891, only)	58 33	
			J. T. Fotheringham	"	Former Assistant Resident Master (salary for Aug., 1891, only)	25 00	
			Dr. J. Thorburn	"	Physician	333 33	
			Mrs. Sewell	"	Matron	272 50	7 50
			George Frost	"	Janitor and messenger	374 50	10 50
			Wm. Chappell	"	Gardener	272 15	5 19
			Albert Baker	"	" (successor to Chappell	47 50	2 50
			Wm. Carrell	"	Engineer	200 00	
			Carried forward				

No. 1.—*Continued.*

Receipts and Expenditure.—*Continued.*

Receipts.		—	To whom Paid.	Service.	Payment to Officer.	Reserved for R.F.	—
		$ c.			$ c.	$ c.	$ c.
Brought forward		44,853 45	*Brought forward*		16,316 18	524 44	
Entrance fees	$635 00			Authority.			
Less fees of Hett & Kingsford, cheque dishonoured	4 00		R. Saxby ....O. C.	Salaries, etc.—*Continued.*			
		631 00	George Robertson .... "	" (successor to Carrell	585 00	22 50	
Insurances :—			H. F. Crate.....M.	Stoker, etc	72 22		
Amount paid for workmens' risk during construction of new building, wrongly charged to this account in previous year, now credited (payment transferred to expense account)		561 77	John Alward ..... "	Stoker, etc. (successor to Robertson)	26 25		
			Samuel G. Ball ..... "	" " Crate)	152 28	5 00	
			Alex. Martin.....M.	" " Alward)	95 00	5 00	
			D. Sutherland..... "	Nightwatchman	68 00		
			E. Stopps ..... "	" (successor to Martin)	31 67	1 67	
			John Martin ..... "	" " Sutherland)	31 67	1 66	
			B. Halfpenny ..... O.C.	" " Stopps)	31 66	1 68	
Sale of Furniture :—			Servants in Steward's and Matron's Departments, waiters, cook, laundresses, etc	Drill Instructor, etc	316 68		
Amount paid by Trustees, School Section No. 4, Township of Snowdon, for old desks sold to them	$ 16 00						
Leonard Bertrand do	100 00		..... B.	.....	3,041 50		
H. Brock do	14 00		Miss C. Jeffrey .....M.	Stenographer	117 25		
	$130 00		W. S. Jackson..... O.C.	Dean of Residence (allowance)	334 00		
Less amount paid for freight on desks to Trustees' School Section	$3 02				20,288 61	529 45	
		126 98		Total of Salaries and Retirement Fund			20,818 06
Grounds, Old Site :—				Pensions :—			
Amount paid by W. D. Grand for use of grounds	$100 00		John Martland .....O.C.	Instalments of allowance granted by Order-in-Council			708 33
Less paid to Thomas Lloyd for boarding up buildings to keep out depredators, etc	20 00						
		80 00	Toronto Silver Plate Co.... B.	Outfit :—			
			Glover Harrison Estate.. "	Dish covers		32 00	
			George Sparrow & Co..... "	Crockery		83 50	
			J. H. Copping .... "	Trays, etc		22 38	
			H. A. Nelson & Sons..... "	Wringer		7 00	
			Rice Lewis & Son ..... "	Brooms		3 20	
				Platform scale		25 30	

Fox & Co	"	Table tops		12 40		
C. P. R. Planing Mills Co.	"	Picture moulding	9 00			
" "	"	"	11 75			
				20 75		
John Davis & Son	"	Urns for Art Department		21 75		
Alexander & Anderson	"	Cotton duck		98 94		
W. A. Murray & Co	"	Linen		15 78		
J. H. Mackenzie	"	Chemicals for Laboratory	38 51			
"	"	" "	26 08			
				64 59		
The Map and School Supply Co	"	Supplies		197 03		
Hooper & Co	"	" "		3 55		
Hy. S. Thornberry & Co	"	" "		11 65		
James Iredale	"	Galvanized iron trough for Laboratory		14 40		
Toronto Incandsscent Electric Light Co	"	Electrical supplies		163 45		
W. H. Kent	"	Keys		6 00		
Aikenhead & Crombie	"	Hardware sundries and general supplies		94 55		
R. George	"	Steel bar for Gymnasium		14 00		
A. R. Williams	"	Machinery sundries, lamp wick, packing, etc., for engine room		30 70		
McColl Bros. & Co	"	Engine oil		104 48		
C. W. Irwin	"	Duty on apparatus		13 60		
						1,061 00
		Repairs:—				
M. O'Connor	"	Painting, staining, varnishing, etc		248 98		
E. & C. GurneyCo	"	Repairing range, etc		51 80		
W. J. Hallarn	"	Tinsmithing repairs		54 00		
Galloway, Taylor & Co	"	Castings		5 00		
C. Wilson & Son	"	Examining and repairing weigh scales		63 00		
J. Leckie	P.	Wire to repair flag-pole		1 75		
Rolph, Smith & Co	"	Repairing letter press		1 25		
Shipway Mnfg. Co	B.	Repairs to electric bells		3 00		
Jas. Taylor	"	Slating blackboards		5 40		
Wm. Forbes	"	Lumber for repairs		3 00		
Wm. Charlton	"	Sundry labor, repairs		8 12		
Jas. Wells	"	Repairing furniture		40 00		
Vacuum Oil Co	"	Oil		64 35		
McColl Bros. & Co	B.	"		8 70		
Carried forward	46,253 20	*Carried forward*				

No. 1.—*Continued.*

Receipts and Expenditure.—*Continued.*

Receipts.	—	To whom Paid.	Service.	—	—	—
	$ c.			$ c.	$ c.	$ c.
Brought forward	46,253 20	*Brought forward*				
		Authority.	Repairs.—*Continued.*			
		D. W. Smith ... B.	Repairing curtains		11 00	
						569 35
			Incidentals :—			
		Ewing & Notman ... M.	Daily van to College Building	439 25		
		" ... B.	Cab hire	5 50		
					444 75	
		Doane's Livery ... B.	"		15 35	
		Chas. Brown ... B.	"		49 25	
		Robt. Bond ... B.	"		5 00	
		J. Rutherford ... "	Feed for horse		42 87	
		J. Lackey & Co ... B.	"		3 54	
		B. Sinclair ... "	"		9 65	
		Miss Jean Gibson ... M.	Services as Stenographer		10 35	
		Miss Jeffrey ... "	"		70 50	
		George Bengough ... P.	Typewriting		4 70	
		Globe Printing Co. ... M.	One year's subscription to Daily *Globe*		5 00	
		Rowsell & Hutchison ... B.	Books		37 05	
		Williamson & Co ... "	"		28 70	
		P. H. Jackson ... "	Putting platform in Commercial Room		9 98	
		E. H. Roberts ... "	Stamping keys, etc		17 85	
		M. Hinchliff ... "	Labor during Janitor's illness, etc		30 35	
		John Martin ... "	Occasional labor		17 50	
		James Smith ... "	" removing ashes from Boiler Room		8 00	
		George Dickson (Principal). B.	Petty disbursements		375 31	
		Wm. Chappell (Gardener). P.	Petty sundries		1 90	
		George Frost (Janitor) ... "	do	7 38		
		" " ... M.	Removing furniture at old building	7 50		
					14 88	
		Mrs. E. Martin ... M.	Lodging for and attendance on sick boy		30 00	
		Dr. T. Armstrong ... M.	Medical attendance on servant		4 00	
		S. W. Johnston ... B.	Drugs, etc		30 54	
		George Dickson (Principal). M.	Special disbursements *re* moving to new building		357 42	
		Rose Cartage Co. ... "	Moving		256 03	
		George Simpson ... "	"		31 00	

		W. Troughton	"	"		63 00	
		Ewing & Notman	"	"		28 00	
		J. Wells	"	Repairs to furniture after moving		50 00	
		Henry R. Alley	"	Services		100 00	
							2,152 47
				Fuel :—			
		P. Burns & Co	B.	Coal and wood			3,868 21
				Gas and water :—			
		Consumers' Gas Co	B.	Gas		14 70	
		Water Works Dept	"	Water		630 57	
						645 27	
				Less returned by Gas Co., rebate on gas accounts.		34 78	
							610 49
				Telephones :—			
		Bell Telephone Co	B.	Rent of telephones (two years)			60 00
				Grounds :—			
		Wm. Rennie	B.	Seeds		3 00	
		J. C. Bales	"	Hay		18 60	
		Chas. Goulding	B.	Plowing		10 50	
		D. Daniels	"	Fence Posts		7 86	
		Wm. Charlton	"	Shovelling snow		28 20	
		Wm. Roberts	"	"		12 38	
						80 54	
				Less returned by Wm. Rennie, amount overpaid		1 20	
							79 34
				Advertising :—			
		The *Mail*	B.	Advertising re-opening, etc		63 18	
		The *News*	"	" "		7 00	
		The *World*	"	" "		20 00	
		The *Empire*	"	" "		48 95	
		The *Telegram*	B.	" "		28 90	
		The *Globe*	"	" "		66 85	
		Truth	"	" "		45 00	
		Grip	"	" "		5 00	
		The *Week*	"	" "		6 40	
		The *Christian Guardian*	"	" "		9 00	
		The Presbyterian News Co.	"	" "		6 00	
		The *Presbyterian* Pt'g & Publishing Co	"	" "		6 00	
		The J. E. Bryant Co	"	" "		4 50	
						321 73	
				Less returned by The *Telegram*, amount overpaid		1 50	
							320 23
Carried forward	46,253 20	*Carried forward*					

No. 1.—*Concluded.*

Receipts and Expenditure.—*Concluded.*

Receipts.	—	To whom Paid.	Service.	—	—	—
	$ c.			$ c.	$ c.	$ c.
Brought forward	46,253 20	*Brought forward*				
		Authority.	Stationery and Printing :—			
		Lud K. Cameron (Queen's Printer) ..... B.	Stationery		131 03	
		Hart & Co. ..... "	"		13 50	
		Rowsell & Hutchison .... "	Stationery and postage	30 05		
		" .... "	Printing	15 00		
					45 05	
		Warwick & Sons ..... "	"		106 89	
						296 47
			Prizes :—			
		Hunter, Rose & Co. ..... "	Books		122 75	
		Toronto Silver Plate Co... "	Cup		21 63	
						144 38
			Exhibitions :—			
		Reginald Wilson ..... Reg.	Allowance as Exhibitioner			30 00
			Pew Rents :—			
		St. George's Church ..... B.	Pew rent		12 50	
		St. James' Church ..... "	"		100 00	
		St. Andrew's Church ..... "	"		154 50	
		Deer Park Presbyterian Church ..... "	"		172 00	
		Christ Church ..... "	"		56 00	
		Yonge Street Methodist Church ..... "	"		20 00	
						515 00
			Steward's Department :—			
		Swan Bros. ..... B.	Groceries		3,008 23	
		Joseph Norwich ..... "	Meat, etc.		3,404 79	
		George Coleman ..... "	Bread, etc.		1,092 69	
		R. G. Armstrong ..... "	Milk		820 82	
		Barton Bros. ..... "	Vegetables		300 26	
		Smith Bros. ..... "	Fruit, etc.		347 07	
		W. Barrett ..... "	Potatoes		298 50	
		M. Lefebure & Co. ..... "	Preserves		76 79	
		M. Doyle ..... "	Fish		49 12	
		Knickerbocker Ice Co.... "	Ice		111 00	

		G. E. Horning ..... "	Apples		95 20		
		Coolican & Co..... "	Honey		4 80		
		Hereward, Spencer & Co. "	Tea		37 74		
		Pure Gold M'f'g Co..... "	Soap Chips		90 59		
		Laundry Machinery & Supply Co. ..... "	Laundry materials.....		27 49		
		Toronto Steam Laundry .. "	Laundering clothes		156 50		
		M. Rawlinson..... "	Expressage of milk from railway station.....		45 00		
		The Steward (W. Kingdon) "	Petty disbursements.....		45 00		
							10,011 59
			Entrance Fees:—				
			Excess of Receipts over Expenditure, credited to Income Account from December, 1888, to June, 1891, now transferred to Separate Account No. 3.....		351 34		
			Amount received during the year (as per other side) transferred to the same account..		631 00		
							982 34
			Balance 30th June, 1892.....				4,025 94
Total	46,253 20		Total				46,253 20

Explanation of Abbreviations *re* Authorities.—O.C.—Order-in-Council. B.—Board of Trustees. P.—Principal. M.—Minister of Education. Reg —Regulations.

Bursar's Office,
Toronto, 2nd July, 1892.

J. E. BERKELEY SMITH,
Bursar.

C. H. SPROULE,
Provincial Auditor.

No. 2.

UPPER CANADA COLLEGE.

THE BURSAR'S STATEMENT of Receipts and Expenditure on Mason Medals Account for the year ending 30th June, 1892.

RECEIPTS.		EXPENDITURE.	
	$ c.		$ c.
Balance 30th June, 1891	32 00	Ryrie Bros., Medals	33 00
Dividend Canada Permanent Loan and Savings Coy's Stock	54 00	Balance 30th June, 1892	53 00
	86 00		86 00

BURSAR'S OFFICE,
TORONTO, 2nd July, 1892.

J. E. BERKELEY SMITH,
Bursar.

No. 3.

UPPER CANADA COLLEGE.

THE BURSAR'S STATEMENT of Receipts and Expenditure on Entrance Fees Account for the year ending 30th June, 1892.

RECEIPTS.		EXPENDITURE.		
	$ c.			$ c.
Amount transferred from Income Account, being excess of receipts over expenditure credited to that account from December, 1888, to June, 1891	351 34	George Dickson, (Principal). Expenditure on this account...	$100 00	
		" " ...	167 04	
		" " ...	264 23	
		" " ...	200 00	
				731 27
Fees received during year	631 00			
		Balance 30th June, 1892		251 07
	982 34			982 34

BURSAR'S OFFICE,
TORONTO, 2nd July, 1892.

J. E. BERKELEY SMITH,
Bursar.

No. 4.

UPPER CANADA COLLEGE.

THE BURSAR'S STATEMENT of Receipts and Expenditure on the Retirement Fund Account for the year ending 30th June, 1892.

RECEIPTS.	—	EXPENDITURE.	—
	$ c.		$ c.
Amount reserved from salaries of of teachers and officers as per statement No. 1	529 45	Wm. Chappell, amount reserved from his salary, paid to him upon leaving the service	5 19
		John Alward, amount reserved from his salary, paid to him upon leaving the service	5 00
		D. Sutherland, amount reserved from his salary, paid to him upon leaving the service	1 67
		E. Stopps, amount reserved from his salary, paid to him upon leaving the service	1 66
		Balance 30th June, 1892	515 93
	529 45		529 45

BURSAR'S OFFICE,
TORONTO, 2nd July, 1892.

J. E. BERKELEY SMITH,
Bursar.

No. 5.

UPPER CANADA COLLEGE.

Cash balances as at 30th June, 1892.

—	DR.	CR.
	$ c.	$ c.
Cash on hand	162 58	
Cash in Bank of Commerce	4,683 36	
Income		4,025 94
Retirement Fund		515 93
Mason Medals		53 00
Entrance Fees		251 07
	4,845 94	4,845 94

BURSAR'S OFFICE,
TORONTO, 2nd July, 1892.

J. E. BERKELEY SMITH,
Bursar.

PAPERS AND REPORTS

UPON

FORESTRY, FOREST SCHOOLS,

FOREST ADMINISTRATION AND MANAGEMENT

IN

EUROPE, AMERICA, AND THE BRITISH POSSESSIONS,

AND UPON

FORESTS AS PUBLIC PARKS AND SANITARY RESORTS.

COLLECTED BY

MR. A. KIRKWOOD,

(Chief Officer of the Lands Branch of the Department of Crown Lands), under the direction of the Commissioner of Crown Lands,

TO ACCOMPANY THE REPORT OF THE ROYAL COMMISSION ON FOREST RESERVATION AND NATIONAL PARK.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
PRINTED BY WARWICK & SONS, 68 AND 70 FRONT STREET WEST
1893.

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INTRODUCTION.

"A great State was a desert, and the land
Lay bare and lifeless under sun and storm,
Treeless and shelterless. Spring came and went,
And came, but brought no joy; but, in its stead,
The desolation of the ravening floods,
That leaped like wolves or wild cats from the hills,
And spread destruction over fruitful farms;
Devouring as they went the works of man,
And sweeping seaward Nature's kindly soils,
To choke the water-courses worse than waste.

"The forest trees, that in the olden time—
The people's glory, and the poet's pride—
Tempered the air and guarded well the earth,
And, under spreading boughs, for ages kept
Great reservoirs to hold the snow and rain,
From which the moisture thro' the teeming year,
Flowed equably but freely—all were gone.
Their precious bales exchanged for petty cash,
The cash that melted and had left no sign;
The logger and the lumberman were dead;
The axe had rusted out for lack of use;
But all the endless evil they had done
Was manifested in the desert waste.

"Dead springs no longer sparkled in the sun;
Lost and forgotten brooks no longer laughed,
Deserted mills mourned all their moveless wheels
The snow no longer covered, as with wool,
Mountain and plain, but buried starving flocks
In Arctic drifts; in rivers and canals
The vessels rotted idly in the mud,
Until the spring flood buried all their bones;
Great cities that had thriven marv'lously,
Before their source of thrift was swept away,
Faded and perished, as a plant will die
With water banished from its roots and leaves;
And men sat starving in their treeless waste,
Beside their treeless farms and empty marts,
And wondered at the ways of Providence!"

THE UTILITY OF FORESTS.*

The effects of forests may be looked at from the point of view of the owner or from that of the State. The owner considers, in the first place, the benefits which he personally derives from his forests; the State appreciates the effects which they have upon the country and the nation as a whole.

The important direct effects of forests are due to the produce which they yield, the capital which they represent and the work which they provide.

Wood is used as timber in construction, ship-building, machinery, agriculture, for tools, furniture, etc., and as fuel for domestic and industrial firing. The quantity of wood required in a country depends on various considerations. In modern times iron and other materials have, to a considerable extent, replaced timber, while coal, lignite and peat compete with firewood; nevertheless, wood is still indispensable and likely to remain so. The more general introduction of substitutes for firewood has, however, drawn increased attention to the production of timber in preference to firewood. For instance, of the total produce of the Saxon State Forests, only 35 per cent. were classified for timber in 1850, but the proportion has risen to 75 per cent. in 1880. At the same time, new demands for the consumption of wood have sprung up, such as the preparation of wood-pulp for the manufacture of paper. It is estimated that the annual consumption of wood in this industry in Germany alone amounts to upwards of 40,000,000 cubic feet.

Forests as Objects of Industry.

The capital employed in forestry consists principally of the soil and the growing stock of wood. When the working is of an intermittent nature, the amount of capital fluctuates from time to time; when the working is so arranged that an equal annual return is secured, the capital remains of the same amount, and consists of the soil plus the permanently present growing stock.

The soil is called the fixed, the growing stock the movable or shifting capital of forestry. The proportion of the one to the other depends chiefly on the method of treatment. In forests treated as coppice woods the fixed may be greater than the movable capital; but in high forests where the object is to produce timber of some size, the shifting capital is generally of considerably greater value than the soil. An example will illustrate this:—Assuming that an area of one hundred acres is treated as a Scotch pine timber forest, under a rotation of one hundred years, with the object of obtaining an annually equal return; in that case one acre must be stocked with one year old seedlings, another with two year's old seedlings, another with three years' old trees, and so on to the last acre which would be stocked with trees one hundred years old. Every year the oldest wood one hundred years old is cut over and the area at once restocked. Immediately after the cutting ninety-nine acres remain stocked with trees ranging in age from

* A Manual of Forestry: By William Schlich, Ph.D., Principal Professor of Forestry at the Royal Indian Engineering College, Cooper's Hill, England. Dr. Schlich spent upwards of twenty years in the Forest Department of the Government of India, and succeeded Sir Dietrich Brandis as Inspector-General. On his return from India he was appointed Professor of Forestry at Cooper's Hill College.

one year to ninety-nine years old, and this is called the normal growing stock. Without the presence in the forest of this series of age gradations it would be impossible to obtain a regular annual yield of trees one hundred years old.

The subjoined table gives the capital invested in a forest worked upon the principle of a sustained annual yield. The data for the growing stock are taken from the Yield Tables for the Scotch Pine, by M. Weise, converted into English measures. In calculating the value of the growing stock it has been assumed that fagots would not yield any money return, and that timber, including all pieces of three inches diameter and upwards at the thin end, would yield two pence per cubic foot under a rotation of thirty years, gradually rising to five pence per cubic foot under a rotation of one hundred and twenty years. Soil adapted for the growth of Scotch pines is generally light, and the value of such land of the I. or best quality cannot, on an average, be estimated at more than £25 per acre, while land of the III. or middling quality may be estimated at £12 per acre, and land of the V. or lowest quality at £4, though land of the latter quality is not worth more than a few shillings per acre.

Capital Invested in Forestry—Pounds Sterling per Acre.

Length of rotation in years.	I. Quality best.			III. Quality middling.			V. Quality lowest.		
	Land.	Growing stock.	Total.	Land.	Growing stock.	Total.	Land.	Growing stock.	Total.
	£	£	£	£	£	£	£	£	£
30	25	8	23	12	2	14	4	1	5
40	25	17	42	12	7	19	4	3	7
50	25	26	51	12	12	24	4	5	9
60	25	35	60	12	17	29	4	8	12
70	25	45	70	12	22	34	4	11	15
80	25	56	81	12	28	40	4	15	19
90	25	68	93	12	35	47	4	20	24
100	25	80	105	12	42	54			
110	25	93	118	12	50	62			
120	25	106	131	12	58	70			

(1). This table shows that the capital increases with the length of the rotation.

(2). That the value of the growing stock is at first smaller than the value of the land, equal to it under a rotation of from forty to fifty years, and greater after that period.

(3). That the capital invested in timber forests is considerably greater than that of the land only.

Precipitations or Rainfall.

The question whether, and in how far, forests affect the rainfall is one which has been actively discussed for many years past, but so far no final decision has been possible. That forests can affect precipitations follows from the facts that forest air is relatively moister than air in the open and that the trees mechanically affect the movement of the air; but, on the other hand, the rainfall depends chiefly on other much more powerful agencies, in comparison with which the effect of forests is small. Numerous comparative observations have been made, but only a certain portion has so far been published and unfortunately those which seem to indicate a decided effect of forests on the rainfall are not always very reliable. The great difficulty in comparing the results of observations at forest stations (that is to say stations situated inside a forest) with those of the ordinary meteorological stations consists in the fact that elevation above the sea affects the rainfall most powerfully because air cools on rising and precipitations become more frequent with elevation.

Although further observations are necessary before a final conclusion can be arrived at, the following data may prove interesting :—

In the Prussian system the forest stations have shown the subjoined increase of rainfall over the average rainfall of the open country as taken from the ordinary meteorological stations :

Excess of rainfall in forest station over that of open country, in per cent. of the latter rainfall—

Between sea level and	328	feet elevation....			1.25	per cent.
"	328	and	556	"	"	....	14.2	"
"	1,969	"	2,297	"	"	....	19.	"
"	2,297	"	2,625	"	"	....	43.	"

Although these figures may not represent the absolute facts of the case, they seem to indicate that in the plains forests have very little effect upon the rainfall, if any at all, but that their influence becomes considerable with increasing elevation in mountainous countries.

The results of seven years' observations made at two stations near Nancy show a decided increase of rainfall in the forest. The stations are situated 1,247 feet above the sea, one in the middle of an extensive forest five miles to the west of Nancy, the other in an almost woodless country six miles to the north-east of Nancy.

The results were as follows:

Increase of rainfall in forest over that in the open in per cent. of the latter—

February to April	7	per cent.
May to July	13	"
August to October	23	"
November to January	21	"
Mean of year	16	"

Evaporation.

Owing to the lower temperature, the greater humidity of the air, and the quieter state of the atmosphere, evaporation must be considerably smaller in

forests than in the open. This has been conclusively proved by direct observations. Those made in Bavaria and Prussia show the following results :—

Stations.	Quantity of water evaporated from a free surface of water, height in inches.			Less in forest expressed in per cent. of the total quantity evaporated in the open.
	In the open.	In forest.	Less in forest.	
Bavarian	23.53	8.61	-14.92	-63
Prussian	13.16	5.98	-7.18	-55
Mean	18.34	7.29	-11.05	-60

These data show that evaporation in the forest was only two-fifths of that in the open country.

The effect of this action is that of the water which falls on the ground in a forest a considerably larger proportion is secured to the soil than in the open. That water is available to be taken up by the roots, while any balance goes to the ground water and helps to feed springs. Of considerable importance in this respect is the covering of forest soil. Dr. Ebenmayer's observations on this point, extending over five years, show the following results :—

Water evaporated from soil in the open	100 parts.
Evaporation from forest soil, without leaf mould	47 "
" " " with full layer of leaf mould	22 "

In other words, forest soil without leaf mould evaporated less than half the water in the open, while forest soil covered with a good layer of humus evaporated even less than one-fourth of that evaporated in the open.

The result of these peculiarities is that, at any rate up to a certain elevation, the forest soil retains, after allowing for evaporation, more water than open soil, although some 23 per cent. of the rainfall are intercepted by the crowns of the trees In order to illustrate this the following table, taken from Dr. Weber's calculations, is inserted, as it shows the balance of rainfall over evaporation according to elevation ; it is based upon Prussian observations :

Altitude of stations in feet.	Excess of rainfall over evaporation in inches.		Percentage of rainfall which evaporated.	
	In the open.	In forest.	In the open.	In forest.
0— 328	12.02	12.32	55	37
328— 656	12.69	13.84	53	30
984—1,312	12.20	17.65	58	25
1,969—2,297	36.96	30.79	22	13
2,540	47.10	43.08	15	9
3,050	56.77	46.34	19	11

This table shows that the balance of water retained by the soil increases rapidly with altitude, and that the evaporation in mountain forests may be reduced to about 10 per cent of the rainfall. If it be remembered that the moisture is most effectually preserved in forests, it will easily be understood why the mountain forests have from time immemorial been looked upon as the preservers of moisture and feeders of springs. No doubt, a certain portion of the water is again taken out of the ground by the roots of the trees and evaporated through the leaves. The quantity thus consumed is not known at present, but it cannot be more than 12 inches, the total quantity available in plain forests, and probably it becomes less with elevation, so that a considerable balance remains available in hill forests for the feeding of springs.

Mechanical Effect of Forests.

The mechanical effect of forests makes itself chiefly felt in regard to the distribution of the rain-water, the preservation of the soil on sloping ground, the binding of moving sand, the prevention of avalanches, and the moderation of air currents.

(*a*) *Feeding of springs and rivers.*

Most of the rain-water falling on a bare slope rushes down into the nearest water course in a comparatively short time, thus causing a rapid rise in the level of the stream. Only a comparatively small portion sinks into the ground, so as to become available for the feeding of springs. Of the rain falling over a forest, close on one-fourth is intercepted by the crowns of the trees, and the other three-fourths fall upon a layer of humus, which possesses a great capacity to absorb water and to retain it for a time. It has been shown, for instance, that mosses of the species *Hypnum*, which grow under the shade of conifers, can absorb up to five times their own weight of water, and peat mosses of the genus *Sphagnum* up to seven times, while the leaf-mould to be found in a middle-aged well-preserved beech wood can absorb and retain for a time a rainfall of five inches. Part of the water thus absorbed penetrates into the ground and becomes available for the feeding of springs, while the rest gradually finds its way into the nearest stream. In this manner well-preserved forests must have a decided effect upon the sustained feeding of springs, and the moderation of sudden floods in rivers. When, however, the humus has been saturated with water and rain continues, the effect of forests as regards inundations must cease, because the additional water follows the laws of gravity, and finds its way into the valleys.

(*b*) *Protection of the soil.*

Water rushing down a bare slope possesses a great mechanical power, by means of which it loosens the soil, and carries it down hill. In this way land-slips are often caused, ravines are formed, and fertile land situated at the foot of the ravine may be covered with silt and rendered valueless. Frequently the *debris* collects in rivers and forms obstructions, which are followed by a diversion of the bed and erosion of fertile lands. The rate at which this process proceeds depends on the geological origin and the formation of the surface; the less binding the soil and the looser the formation the greater will be the damage. If, on the other hand, such a slope is covered with a well-preserved forest the roots of the

trees and the layers of humus keep together, and protect the soil against the action of water, besides the crown intercepts and retains, at any rate for a time a considerable portion of the water. On the whole a series of obstacles are, opposed to the movement of the water, which reduce its velocity and force, or at any rate divide it into numerous small channels. The beneficial effect of tree vegetation in this respect can be observed in most mountain ranges, and especially in the Alps from France to Austria. Wherever, in these parts, extensive deforestations have taken place, the consequence has been the gradual formation of a series of torrents, in all places where the surface did not consist of hard rock; the *debris* brought down has covered more and more fertile land at the base of the torrents, and this evil has grown to such an extent, that not only in France but also in the other Alpine countries great efforts are now made to re-afforest the denuded areas at a great outlay. When once the evil has been created immediate afforestation is not possible; it must be preceded by the construction of dams, dikes, walls, etc., to steady the soil until the young forest growth has had time to establish itself, and once more to lay hold of the surface soil. Forests protect the soil not only in the hills, but also in low lands, wherever it consists of so-called moving or shifting sand along the sea coast, as well as in the interior of countries. The action in this case is due partly to their moderating the force of the air currents and partly by keeping the soil together through their roots, by the formation of humus and the retention of moisture. In this way the Landes of France have from a dreary waste been converted into extensive forests intersected by cultivated fields.

(*c*) *Protection against air currents.*

Forests break or moderate the force of air currents, and in this way afford protection to lands lying beyond them against cold or dry winds. Woodlands afford also shelter to game and useful birds. Their importance in this respect should not be overlooked; the presence of birds, which are the great enemies of injurious insects, depends often on that of woodlands.

Hygienic Effects of Forests.

Forests, in forming a substantial part of the vegetation of the earth, are an important agency for the production of oxygen obtained by the decomposition of carbon dioxide. Direct observations have also shown that forest air (like sea air) is much richer in ozone than the air of open countries, and especially of towns.

If forests, then, produce oxygen and ozone and protect human habitations against injurious air currents, they may exercise a beneficial effect upon the healthiness of adjoining lands. Instances are not wanting where forests are said to have given protection against the germs of malaria, but there are others where they are said to have had the opposite effect. As far as India is concerned, in some cases the medical authorities of military cantonments ordered forests to be planted, and in others to be cut down. Whether certain species, such as eucalyptus, really possesses the quality of drying up soil, and thus remove swampiness, has yet to be proved.

No general rule can be laid down showing whether forests are required in a country or what percentage of the area should be so used. The forest question

must be determined on the special circumstances of each country. By way of illustration the areas at present under forest in a number of countries are shown in the following table:

Countries.	Area under forest, in acres.	Percentage of total area of country under forest.	Forest area per head of population, in acres.	Distribution of forest area, according to ownership, in percentage of total forest area.		
				State and crown forests.	Forests of corporations, endowments, etc.	Private forests.
Servia	5,166,000	48	3.3	..	..	..
Russia-in-Europe	527,427,000	42	6.1	60	40	..
Sweden	42,366,000	42	9.1	20	80	..
Austria proper	24,161,000	33	1.1	6	94	..
Hungary	22,603,000	29	1.4	16	52	32
Germany	34,350,000	26	.8	33	19	48
Norway	18,920,000	25	9.9	12	3	85
Turkey, including Bulgaria, Bosnia and Herzegovina	20,512,000	22	3.5	..	..	..
Roumania	4,883,000	22	.9	..	..	..
Italy	14,235,000	22	.5	4	43	53
Switzerland	1,930,000	19	.7	4	67	29
Spain	21,345,000	17	1.3	82	..	18
France	20,750,000	16	.6	11	23	66
Greece	2,026,000	16	1.2	80	..	20
Belgium	1,073,000	15	.2	..	..	..
Holland	554,000	7	.1	..	..	..
Denmark	477,000	6	.2	..	..	..
Portugal	1,166,000	5	.2	..	..	..
Great Britain and Ireland	2,790,000	4	.1	..	..	..
Total for Europe	766,824,000	31	2.5	..	..	..
United States of N. America	380,000,000	17	7.6	..	..	..
East India, British	140,000,000	25	.6	50	50	..

The percentage of forest area varies from 48 to 4, and the area per head of population from 9.9 to .1 acres. This shows that the general conditions in the various countries must make different demands in respect of afforestation. Servia, Russia, Sweden and Norway may as yet have more forests than they require for their own population. On the other hand Great Britain and Ireland, Portugal, Denmark, Holland, Belgium, and even France and Italy have a smaller forest

area than is necessary to supply them with a sufficient quantity of forest produce At the same time, they are all sea-bound countries, and consequently subject to conditions, which differ altogether from those found in continental countries; most of them are under the influence of moist sea winds, and all are favorably situated in respect of importation by sea.

Intimately connected with the area under forest in a country is the state of ownerships. Forest owners in Europe may be grouped into the following three great classes:

(*a*) The State or the Crown.

(*b*) Corporations, endowments, etc.

(*c*) Private persons.

Where forests are not required on account of their indirect effects, and where importation from other countries is easy and assured, the government of a country need not, as a rule, trouble itself to maintain or acquire forests, but where the opposite conditions exist, that is to say, where forests are necessary to produce climatic and mechanical effects, and where the cost of transport over long distances becomes prohibitive, a wise administration will take measures to assure the maintenance of a certain proportion of the country under forest. This can be done either by maintaining or constituting a certain area of State forests, or by exercising a certain amount of control over private forests. In most of those countries where corporation forests exist they are subject to the control of the State, though the degree to which such control is exercised may differ. Private forests are free from control in some European States, and subject to it in others. In all such cases the State is only justified in interfering when the welfare of the general community requires it. The extent to which interference may be carried depends on the special conditions of each country, and on the proportions of the forest area belonging to the State. Thus, of the Swiss forests only 4 per cent. belong to the State, while 67 per cent. belong to corporations, and 29 per cent. to private owners; at the same time a large proportion of them are so-called protection forests, and in consequence the Government exercises an extensive control over both corporation and private forests. Of the German forests, 33 per cent belong to the State, 19 per cent. to corporations, and 48 per cent. to private persons; the corporation forests are under State control, making with the State forests 52 per cent. This being more than one-half of the area, the control over private forests has of late years been considerably reduced, and in some parts abolished altogether. It is worthy of notice that only 20 per cent. of the Swedish and 12 per cent. of the Norwegian forests belong to the State, while the bulk are private forests, over which little or no control is exercised by the State. Large quantities of timber are exported annually from these countries to Great Britain and other countries, and it may safely be expected that these supplies will considerably decrease in the course of time.

DEFORESTATION IN RUSSIA.

The following article appeared in a recent number of the *Literary Digest.* It was translated from *Preussiche Jahrbucher* for July.

When treating of the Russian famine of 1891-92 in the April number of this magazine, we remarked that this was not to be regarded as a passing incident, but rather as the inauguration of a chronic condition of affairs traceable to

unsystematic farming, to the general withdrawal of capital from the land for investment in manufacturing enterprise, under the aegis of a protective tariff, and to the general deforestation of the country, in great part to provide fuel for railroads and protected enterprises. The fatal consequences of this general deforestation are now generally appreciated, the shrunken state of the once noble rivers of the country, and growing aridity of the climate, affording evidence that can neither be overlooked or gainsaid.

The regions of the mighty rivers, the Don, Volga, and the Dneiper, the great arteries of Russia, were formerly fringed with wide-spreading forests, along their whole upper and middle courses, which sheltered their sources and tributaries from evaporation throughout the year. These forests have now for the most part disappeared. Mile after mile the traveler sees nothing but low scrubs and melancholy stumps in unbroken succession; the "Mother Volga" grows yearly shallower; the steamers find scarcely seven or eight feet of water in mid-stream, and the ferries pursue their snake-like course from bank to bank in search of the ever-shifting channel. The Don, with its tributaries is choked; the sources of the Dneiper creep downward and its chief tributary, the once noble Worskla, with a flow of some 220 English miles, is now dry from source to mouth.

The city of Poltawa lies on its banks, and it was at its mouth that the Swedish Army surrendered to Peter the Great. This stream, which fertilized a broad region, supporting a numerous population, exists no more—not temporarily run dry, but with all its springs exhausted, so that in future it may be stricken from the map. Of the Bitjug, another river in the Don region, the upper course has wholly disappeared—valley and bed are filled to the bank with sand and earth. As if by magic, wide, fertile lands are buried under the sands, and whole villages desolated. "There has been," says Wiestnik Jewropy, "an unparalleled revolution of natural conditions, which threatens a great part of the country with the heat and aridity of the Central Asian steppes. The present condition of our black earth region is so serious, and its future so dangerous, that it cannot possibly escape the serious attention of the Government, the scientist and the husbandman, to whom the further development of the situation is perhaps a question of life and death."

There is perfect unanimity in attributing the threatening catastrophe to the denudation of the forests. Innumerable factories sprang into existence, and, in the absence of any systematic provision for coal-supply, they were erected in the heart of the forest, and, after having consumed all the available fuel within easy distance, their plant was actually sometimes transferred to fresh fields. Thus originated the system of wholesale destruction, which was liberally furthered by the network of railways built to maintain their communication with the great marts of commerce and provide generally for the transport of produce. For the past forty years thousands of locomotives and factories have been run almost wholly with wood without a thought being given to any provision for reproduction. The extension of the railways afforded an opportunity for extracting colossal fortunes from the "worthless" forests. These were the manufacturers' views also; so the fate of the Russian forests was sealed. "The machines have devoured the woods."

The recently passed law for the protection of the forests has come fifteen, twenty, or twenty-five years too late to avert the destruction of the agricultural region.

And the Government and people of Russia had already been warned. Forty-two years ago—that is, shortly after the famine of 1847-49—we find the following in a letter from the Charkowski Government to the Imperial Society of Econo-

mics: "There are now living people who remember when the present limitless expanse of sand-waste along the banks of the Donez was covered with almost impenetrable forest, interspersed with lakes, which have since dried up, or are fast drying up. Our region is flat, deforested, and exposed to all winds. The fatal east wind finds no impediment, and brings ruin in its train. This wind will perhaps at no distant date prove fatal. The Grecian colonies went under probably from the same cause. Protect the forest; so plant forests; protect them with rigorous laws. The Volga and Don and all the rivers of southern Russia will be silted up and disappear unless the forests be protected."

More fatal even than the drying up of the streams is the cessation of the spring and summer rains. This is the immediate cause of last year's harvest failure, and on it even depends the current year's harvest. There have been local rains, but not nearly enough.

This reversal of old conditions has been coming on gradually with the denudation of the forests; and emphatic warnings, as we have seen, have been uttered. The only result has been the appointment of commissions which have done nothing. Remedial measures on a large scale are now contemplated. Are they too late?

A PLEA FOR PLANTING.

The sixth Earl of Haddington, in a work in the form of letters to his grandson, published in 1773, says: "When I came to live here (1770) there were not above fourteen acres set with trees. I believe that it was a received motion that no trees would grow here on account of the sea air, and the north-east wind; so that the first of our family, who had lived here, either believed the common opinion, or did not delight in planting." He continues: "I had no pleasure in planting, but delighted in horses, and dogs, and the sports of the field; but my wife did what she could to engage me to it, but in vain. At last she asked leave to go about it herself, which she did, and I was much pleased with some little things, which were well laid out and executed. These attracted my notice, and the Earl of Mar, the Marquis of Tweedale, and others admired the beauty of the work, and the enterprise of the lady." After his lady had planted several ornamental clumps in the shape of wildernesses, she proposed to plant a field of about three hundred Scotch acres, called the Muir of Tynningham, a waste common of very little value. From this all her ladyship's friends, as well as her lord, tried to dissuade her, but in vain; she planted this likewise. In 1707 she began Benningwood; the prejudice of the country being still against her, they continued to deride her, telling her it could be of no use. Success, however, always gave her encouragement. The next was a large tract of ground, mostly dead sand with very little grass, and very near the sea. Here her ladyship participated in the common prejudices, and thought it would be of no use, but as a gentleman from Hamburgh, being there on a visit, told her he had seen timber growing on such land, she immediately formed a resolution of putting it to a test; planted sixty-seven acres of it; and the trees grew to the astonishment of all who saw them. Thus her ladyship, to the honor of her sex and benefit of her lord and her country, overcame the prejudices of the sea and the barren moor being pernicious, and of horses and dogs being the best amusement for a nobleman; converting a dashing son of Nimrod into an industrious planter, a thoughtless spendthrift into a frugal patriot. His lordship goes on to say the next was a field, which he had often let to tenants, who could do nothing with it; and further, that he had a great deal

more waste land, and intended to plant it all. These woods were of all the usual sorts of timber, fir, beech, chestnut, larch, etc. But oaks were the favorite and succeeded extremely well in every sort of soil.

"Thus can good wives, when wise, in every station,
"On man work miracles of reformation,
"And were such wives more common, their husbands would endure it,
"However great the malady, a loving wife can cure it.
"And much their aid is wanted, we hope they'll use it fairish,
"While barren ground, where wood should be, appears in every parish."

Trees for Shelter.

Fuller in his "Practical Forestry" very truthfully says that pioneers in heavily wooded regions are usually anxious to make a clearing, and as every tree felled not only increases the area which he is to cultivate, but extends his view, the axe is often kept in use long after there is any necessity for the purpose of obtaining land for cultivation. In a few years the settler who was at first so anxious to open up the country, finds he has gone a little too far in this direction, for his own comfort and that of his animals, for on taking down the screen, he has not only admitted the cold winds of winter, but those of summer sweep over his fields, driving away needed moisture—whip the fruit from his trees before it is ripe, and otherwise cause loss that might have been prevented.

It is then that he begins to feel the need of protection, and to wish that his house and outbuildings were located by the side of some friendly forest or grove.

The hygroscopicity of humus or vegetable earth is much greater than that of any mineral soil, and consequently forest ground, where humus abounds, absorbs the moisture of the atmosphere more rapidly and in larger proportion than common earth. The condensation of vapour by absorption develops heat, and consequently elevates the temperature of the soil which absorbs it, together with that of air in contact with the surface. Von Babo found the temperature of sandy ground thus raised from 68° to 80° F., that of soil rich in humus from 68° to 88° F.

The question of the influence of the woods on temperature does not, in the present state of our knowledge, admit of precise solution, and, unhappily, the primitive forests are disappearing so rapidly before the axe of the woodman that we shall never be able to estimate with accuracy the climatological action of the natural wood, though all the physicial functions of artificial plantations will, doubtless, one day be approximately known.

But the value of trees as a mechanical screen to the soil they cover, and often to ground far to the leeward of them, is most abundantly established, and this agency alone is important enough to justify extensive plantation in all countries which do not enjoy this indispensable protection.

FORESTRY BYE-PRODUCTS.*

It has been said that there is in the British Isles an immense area of land that either never has yielded, or at the present time does not yield, any agricultural rent, but which might become of value were capital invested in planting it with timber trees.

Though, in common with other trades, the British production of timber has been rendered far less remunerative than formerly by keen foreign competition, it can be shown that timber will yet, in many cases, yield a very fair return for capital.

The forest produce of Great Britain is mainly applied in the following ways:—

1. Ship and boat-building, piers, bridges, etc., requiring much large and sound timber.
2. Building, scaffolding, etc.
3. Railway sleepers.
4. Pit props.
5. Fencing.
6. Furniture; mainly chairs of beech, yew, etc.
7. Hop poles and agricultural implements.
8. Bobbin wood.
9. Fagots and firewood.
10. Charcoal for gunpowder, pitch, etc.
11. Bark for tanning.

In the first four of these branches, the produce of the forests of Scandinavia, for the present apparently inexhaustible, shipped at the very smallest modicum of profit to the producers, has almost driven British timber out of the market. The rent charges on land, the costliness of labor and of overland transit in Great Britain, may be contributing causes to this result; but it is also apparently the fact that the sending of crooked or heavily-shaped timber into the market by British foresters is another reason for the success of Scandinavian trade. The best means of meeting foreign competition is by looking to increased economy of production, coupled with excellence of quality; and as in other trades, it is probable that the utilization of waste substances and bye-products may prove the chief key to economical production. Hop poles, agricultural implements, and bobbin-wood are locally among the most remunerative outlets for coppice produce, the main question with reference to them being economy of prodnction and utilization of waste.

Though hops form a very uncertain and costly crop, the profits on hop-growing are so considerable that the extension of its culture should be considered by our farmers. Chemical substitutes for hops cannot be successfully used to the exclusion of the natural bitter; whilst the "bine" could be sold in the manufacture of textile products, or of paper. The Spanish chestnut, ash, and larch are largely grown for hop-poles in the south of England.

Ash is also in constant demand for the handles of ploughs, spades, axes, and other implements, and is, like sycamore, the wood of which is considerably used by wheelwrights, a rapidly growing tree.

* By G. S. Boulger, F.L.S., F.G.S., *London*, in Forestry and Forest Products (Edinburgh), 1884.

The cultivation of hornbeam for such purposes might also be extended more especially on poor gravelly land.

There are undoubtedly many trades not thought of by the timber merchants in which considerable quantities of small woods are consumed; thus it is alleged by United States statisticians that besides 300,000 new telegraph poles, and 3,000,000 cords of wood used in brick-burning, the making of shoe-pegs alone uses 100,000 cords of soft maple annually, that of lucifer matches 390,000 cubic feet of pine, and that of boot-lasts and tool-handles 1,000,000 cords of birch.

Such facts suggest the possibility of a remunerative production of larger quantities of coppice woods.

It being man's highest intellectual function to utilize to the full all the latent powers of nature, we may well direct our attention to such bye-products as bark, charcoal, wood-spirit, turpentine, tar, sawdust, leaf-manure, and wood-ashes.

Bark.

Bark is used for tanning, *i.e.*, for the conversion of hides or skins into a strong, supple, impenetrable, and durable material known as *leather*, by the union of albumen, gelatine, or collagen of their connective tissue, with a substance in the bark known as *tannin*, so as to form insoluble tannates. Tannin is widely distributed throughout the vegetable kingdom, especially in barks, fruits, and galls. It is characterised by a slightly acid reaction, and astringent taste, a blueish or greenish black coloration (ink), with ferric salts, the precipitation of gelatine and albumen from their solution, and its union with them as above mentioned. Sumach leaves form a valuable material for white morocco leathers; divi-divi, the seed-pods of cœsalpinia; "hemlock extract," a decoction of the bark of the hemlock-spruce (*Abies canadensis*); and "mimosa bark" from the Australian "wattles" (*Acacia*) are largely used, but the chief British tanning material is oak bark. In France the young bark of the cork oak (*Quercus suber*) is largely used, and for fine leather that of the evergreen oak (*Q. ilex*); in the eastern United States the white oak (*Q. alba*), the quercitron (*Q. tinctoria*), and the red oak bark are employed, while California and the western territories depend on the chestnut oak for tanning purposes.

When coppice was largely grown for bark a rotation of twenty-four years was common, the stools being eight feet apart, the trees are more productive in proportion at twelve than at double that number years' growth. Branches down to an inch in diameter should be carefully peeled, since their bark contains a higher proportion of tannin than that of the trunk.

Since the low prices for bark have made many foresters doubt the expediency of felling their oak in May when the timber is almost at its worst, it may be well to bear in mind that French and Prussian experiments have shown that bark of good quality may be obtained at any season by steaming the wood for from one-and-a-half to two-and-a half hours according to the season, after which the bark peels easily.

Willow bark is largely and successfully used in Russia for the best leather, and the bark of young alder shoots, not a third of an inch in diameter, yields sixteen per cent. of tannin. The bark of pine and larch is only used for roughly tanning sheepskins.

There is a possibility of chrome-tanning superseding the use of bark of any kind.

Charcoal.

The value of charred wood-fibre, deprived of its liquid and volatile portion by destructive distillation, for smelting and heating purposes, has long been recognized. Though now in England, Belgium and other coal producing countries, cheapness of production outweighs considerations of quality, the value of Swedish iron is, probably with justice, attributed to its being smelted with charcoal; and many of the furnaces of the United States are as dependent upon the wood supply, as were those of Sussex in the sixteenth and seventeenth centuries. For charcoal making, the hard woods are mainly used; beech charcoal being preferred in the mineralogical laboratory.

In Great Britain the chief use of charcoal is in the manufacture of gunpowder, for which purpose a highly inflammable quality, which is obtained from light spongy woods of various broad-leaved species is generally required; it requires to be as free from earthy or mineral matter as possible, though no charcoal is absolutely pure carbon, generally retaining as it does, some hydrogen and oxygen, as well as mineral ash. For this reason, though still largely prepared by the primitive method of pits or heaps covered with turf, charcoal is preferably manufactured in iron cylinders or retorts—a method which is far more economical and yields a more uniform result. The inflammable gases distilled from the wood are conveyed by pipes into the furnaces below the retorts, so that an immense saving in fuel is effected, while the tar, pyroligneous acid, etc., are condensed and collected. The temperature at which the wood is charred exercises a great effect upon the properties of the charcoal. The higher the temperature the more completely are the hydrogen and oxygen of the wood driven off, and the denser and blacker is the resulting charcoal, while its temperature of ignition is also higher in proportion. Slack-burnt charcoal retains more volatile matter, is softer, reddish, more readily inflammable and more hygroscopic.

It has been found by experiment that, with sixty grains of saltpetre, twelve grains of each of the following kinds of charcoal give the number of cubic inches of gas (CO_2) in the table:—

Dogwood (*Rhamnus frangula*)	82	cubic inches.
Willow (*Salix alba*)	77	" "
Alder	74	" "
Filbert	72	" "
Fir, chestnut, hazel	66	" "

The three first named species are accordingly preferred for the purpose, though *Cornus sanguinea*, *Euonymus europæus*, *Rhamnus catharticus*, and perhaps other species are not uncommonly substituted for the alder-buckhorn, berry-bearing alder, or true "dogwood" of gunpowder manufacturers. *Rhamnus frangula*; this is a slow-growing shrub, being cut, when about an inch in diameter and under ten years of age, in lengths of not more than six feet. It is grown in Prussia, Belgium, and Sussex. It forms a very explosive powder, used for military small arms, and for sporting purposes. Willow and alder are of quicker growth, especially the former, and are cut when about four inches in diameter. With reference to the use of the two last named species an important fact is that they can be cut in the spring, when their bark is in the best condition for tanning purposes. Charcoal is also of great value as a filtering and deodorising agent.

Volatile Products.

Besides a certain amount of tar, and the inflammable gases which, as has been stated, are utilized as fuel in the charcoal manufacture, even the smoke has proved of considerable value. It contains methylic alcohol, which also distils over from the retort in a liquid form, accompanied by acetic acid. This crude distillate is known as "wood vinegar," and is redistilled and rectified over quicklime, yielding "wood-spirit" (crude methylic alcohol). The acid portion is then saturated with slaked lime, so as to form a solution of calcium acetate, which is evaporated, the salt being used in the manufacture of acetic acid and metallic acetates, especially that of lead, as as a step towards the formation of white lead.

Dr. Hough describes a charcoal iron-smelting factory in Michigan, where a cord of wood yields forty-two bushels of charcoal, worth 7 cents per bushel, or $2.99 cents per cord, besides 2,800 cubic feet of "smoke," valued at over 30 cents, and the inflammable gas which supplies three-fourths of the fuel consumed. The "smoke" yields two gallons of wood-spirit, worth 85 cents (3s. 4½d.) per gallon in the Chicago market, and 200 lb. of acetate of lime, worth 2½ cents (1¼d.) per lb. in Philadelphia. Thus the "smoke" for which 30 cents (1s. 3d.) are paid, yields $6.70 (£1 6s. 9d.) the total yield of a cord of wood being $9.69 (£1 18s. 8d.) These products are best obtained from dry hard woods, especially beech.

Tar and Pitch.

The mixture of heavy non-volatile hydrocarbons known as tar, though obtained in small proportions in the destructive distillation of all kinds of wood, is yielded mainly by the roots, boles, branches, and waste timber of pines, especially *Pinus palustris*, *P. sylvestris*, and *P. pinaster*. It is mainly imported from the southern United States, from Archangel, and from Riga and other Baltic ports.

The pitch pine (*P. palustris*) covers extensive tracts, and springs up spontaneously in the disused cotton fields of the Southern States, while the Scots pine (*P. sylvestris*) forms enormous forests in the North of Europe and in Siberia. The preparation of tar is still virtually the same as that described by Theophrastus. A hole is dug in the side of the bank in which billets of wood are heaped up and covered closely with turf or earth, a fire is then kindled from below, and the slow combustion causes the tar to exude from the wood and flow out from the heap into barrels placed below to receive it. On distillation, tar yields wood vinegar, creosote, and oil of tar, leaving a residue of pitch. The black, brittle, glossy solid which we know as pitch, and which is mainly home manufactured, is usually obtained by simply boiling the tar, so as drive off the volatile oils.

Turpentine, Resin, etc.

In addition to being our chief sources of tar and pitch, the firs are the exclusive commercial source of the oleo-resin known as turpentine. This is a solution of a resin in a volatile oil which exudes from incisions made in the stems of these trees. On distillation it yields from 14 to 16 per cent. of colourless essential oil, known as oil or spirits of turpentine (C_{10} H_{16}), the residue being resin or colophony (the formula of which is probably C_{44} H_{62} O_{04}). The greatest quantity of turpentine imported is the produce of the pitch pines (*Pinus*

palustris, or *P. australis*), the swamp pine, and *Pinus tæda*, the frankincense pine of Virginia, Carolina and other Southern States, but a considerable quantity imported from Russia and Sweden, is the produce of the Scots pine (*P. sylvestris*), and from the south of France, under the name of "Bordeaux turpentine," where it is obtained from the cluster pine (*P. pinaster*), and other species. Strasburg turpentine is obtained from the silver fir (*Abies pectinata*), and "Venice turpentine" from the larch (*Larix europæa*). Canada balsam is a similar product from *Abies balsamea* and *A. canadensis*. The cultivation of the cluster pine (*P. pinaster*) on the sand dunes of the Landes of Bordeaux is a good example of the conversion of an originally merely protective measure into a source of profit from soil formerly worse than useless. Whether the felling of the forests of Southern France, by producing floods and droughts, was or was not, originally the cause of the arid barren sands, certain it is that by damming up the natural drainage and shifting inland, these dunes produced swamps and wastes, the advance of which was only stopped by the binding roots of these pines. Originally planted with this protective object, their yield of timber, bark, turpentine and tar, has rendered them a source of profit, which should remind us that we have in our own country considerable stretches of sand wastes. A useful illuminating oil containing from 80 to 92 per cent. of carbon has been obtained by M. Guillemara from the resin from the Bordeaux area.

Minor Products.

Besides such substances as bark, charcoal, wood-spirit, acetic acid, tar, pitch, turpentine, and resin, which are important articles of commerce, chemical discovery has demonstrated in the past, and may be expected to show still more frequently in the future, the presence of substances in trees which might well form sources of profit. For example: from the sap of the Scots pine and of the larch felled in summer, barked and scraped, a substance known as "coniferin" is obtained, which yields "vanillin" the essential constituent of "vanilla." Though an expensive substance to prepare, this is considerably cheaper than common vanilla, the sole source of which is the inner pulp of the pods of one or two species of orchid.

Another similar product, not as yet much developed, is the "rubber" obtained by distillation from the bark of the common birch, a black, gummy "latex," which resists the action of air and acids, and which will considerably increase the durability of india-rubber or gutta-percha, even if mixed with them in only a small proportion. As in the salt mines of Stassfurt it has been found that the formerly wasted bye-products, the salts of potash, are as valuable as the rock salt, if not more so, and as in Michigan the "smoke" has proved more valuable than the charcoal, so the development of new chemical industries may render such products as this vanillin and gutta-percha more remunerative than the timber itself.

Leaves, Sawdust, Etc.

In Styria young pine and fir needles, from loppings or thinnings made in spring, are dried in ovens or kilns, ground, mixed with one-twenty-fifth of salt, and used with advantage as a food for cattle. Similarly, in the north of Italy the dried leaves of the poplar have long been used as cattle food, and chemical analysis bears out their value for this purpose. When not used for fodder, however, dried leaves make an excellent litter, and analysis proves their value as manure.

The following table, prepared in Bavaria, exhibits the composition of the leaves produced annually by an acre of forest under beech, pine, or spruce, as compared with that of a ton of wheat straw:—

	Dry matter.	Ash.	Potash.	Lime.	Magnesia.	Phosphoric acid.	Sulphuric acid.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Beech, per acre of land	2,972	165.5	1.80	17.18	10 90	9.32	3.28
Pine, per acre of land	2,842	41.5	4.32	16.84	4.28	3.28	1.51
Spruce, per acre of land	2,683	121.3	4.30	57.37	6.20	5.72	1.87
Wheat straw per ton	2,240	85.2	9.80	5.20	2.20	4.60	2.41

Saw dust also forms a good litter for cows and horses; and though destitute itself of manurial value, being very absorbent of liquid manure, can, when thus soaked, be used as a valuable top dressing.

Finally, if the forester has any waste that he cannot utilize in the tan pit or the charcoal retort, as paper pulp, or as firewood, it is probably best to burn it so as to avoid harboring insects and fungus life. By so doing he will lose little of the manurial value of the refuse, and leached ashes, being rich in potash, is a valuable dressing for old grass land, orchards, market gardens, onions, rye, and other crops. The potash might even be recovered by lixiviation of the ashes and used for many purposes.

The Production of Wood Pulp.*

The wood-pulp industry may be said to have commenced in the year 1846. But its development during the first thirty years was decidedly slow. Since 1876, however, the production of this material has increased rapidly. Its pre-industrial period was known only to the chemist. Cellulose was made in the laboratory in 1840, but it was not manufactured commercially till 1852. Ground wood was first used for paper-making about the year 1846, when it was manufactured by Keller under a patent taken out in Saxony in the previous year. Since that date many improvements have been made in the machinery and methods used in grinding, the main object being to produce a longer and finer fibre. The fibres of the wood are torn away by mechanical pressure against a revolving grindstone in contact with water. No chemical treatment of the wood is necessary, the only requirements of this industry being cheap wood, abundant water-power and suitable machinery.

Processes, such as Sinclair's, have long been in use for pulping very finely cut coniferous wood, and in the Paris Exhibition of 1880 one of the most prominent objects exhibited in the Norwegian Section was a *pate de bois* or *papier maché*, made in this way from pine wood, and worked into cardboard and various moulded pannellings, etc. It has been found, moreover, that in this way the whole of a pine tree trunk—branches, needles, and all—can be converted into paper without waste. Saplings, which it would not pay to cut for firewood, are now profitably worked up in this way into pasteboard.

* By G. F. Green, C. F. Cross and E. J. Bevan, in Forestry and Forest Products (Edinburgh), 1884.

By the chemical processes for manufacturing wood-pulp, a good class of pulp is made from the quick-growing poplar and from spruce. The wood of the slower growing linden or basswood makes an equally valuable white paper pulp.

Oak can also be used, though yielding an inferior product that requires bleaching. One great advantage in the method is that the tannin in the oak is obtained as a bye-product, and the chemicals with it in the lye being rather an aid than a hindrance to the tanning process, it is found that hides can be perfectly tanned in it in ten days. This seems to offer to the cultivator of oak coppice, or the enterprising planter of poplars, a most important source of income; whilst in coniferous plantations there need be absolutely no waste.

The chemical preparation of fibre has given rise to two distinct processes—the soda process and the acid process.

Chemical pulp (cellulose) is used as an adjunct, with esparto, rags, or mechanical pulp, in the manufacture of news, printings, colors, and some kinds of wrapping-paper. It forms (according to Mr. Routledge) an excellent *succedane*, or filler up, and bleaches to a high color. Fine prints are also manufactured exclusively from acid pulp.

Mechanical pulp is chiefly used as an adjunct in the manufacture of news, cheap printings, and wall-papers; but there are several distinct classes of paper made from it without any other ingredient, viz., wood-pulp middles from white pine pulp, and various self-colored wrappings and tinted wall-papers from brown, sometimes styled patent pulp.

Another important use is for wood-pulp boards and so-called "patent" or brown boards, the latter being produced from brown pine-pulp and the former from white pine-pulp.

The consumption of wood-pulp boards is increasing rapidly, chiefly for making paper boxes, for which they possess certain advantages over straw boards.

Although almost any wood can be converted into pulp, experience has hitherto decided in favor of conifers of a certain age.

For chemical pulp, trees on an average of twenty years' growth, and a thickness of six to eight inches at the base of the stem are said to be the best. Younger wood is more tractable by chemical means, but produces a fibre of inferior quality. Older wood requires stronger chemicals to remove the incrusting matter, and possesses no compensating advantages.

In Canada many species of wood have been utilized, amongst which may be mentioned pine, poplar, spruce, willow, basswood, cedar, hemlock, maple, and birch.

Poplar pulp remains white, birch becomes pink, maple turns of a purple tint, and basswood reddish after grinding,

The practical operations concerned in the manufacture of pulp from wood by the caustic soda process may be divided into the following:—Barking, sawing, chopping, crushing, boiling or digesting, washing and bleaching, treatment for sale as half-stuff, and soda recovery.

Hemlock Extract.

In the final Report of the Select Committee of the House of Commons (Canada) in 1868 on the best means of protecting Hemlock Timber from destruction, the conclusion was come to, after a most careful consideration of the question, that unless some steps were speedily taken to check the wasteful and extravagant rate of consumption then going on, really for the benefit of other countries at the

expense of Canada, many years would not elapse before our own tanneries would bo seriously crippled, and we no longer able to compete successfully with other countries in the manufacture of leather.

Answers from Galt, Guelph, etc.:—Hemlock getting scarce; not more than ten years' supply; timber, sawn into lumber, used for rough work, such as roofing, etc.

Large quantities in Drummond and Arthabaska; five bark factories in the counties; timber used for scantling and rough boarding; in settled districts timber worth four to eight dollars per M; in remote districts not of sufficient value to bear transportation; about one cord of bark is procured from 1,000 feet of lumber; bark in some districts used for domestic purposes only, in others, as Eastern Townships, manufactured into extract; five factories produced twenty thousand barrels of 400 pounds each, worth 2½ cents per lb. at the factory and 5 cents per lb. in Boston; 1½ to 3 cords of bark will produce 1 bbl. of extract, worth in Boston $20 a barrel.

On non-resident lands the timber is allowed to rot on the ground, and squatters, as a rule, either burn or allow it to rot if not close to a market.

In some districts the best is sawn into lumber or cut into lathwood for exportation to England, the balance for railroad ties or cordwood.

Wherere a farmer makes bark on his own land, he cuts the peeled trees into sawlogs and clears the land. Where trespassers peel bark they leave the trees to rot.

After the destruction of a hemlock forest it is generally succeeded by a mixed growth of maple, poplar, cherry, and balsam, when not cleared for farming purposes; even if replanted, it would take one hundred years' growth to render it available for tanning or extract purposes.

About 500 lbs. or more of green raw hide can be converted into leather by one cord of bark. Hemlock extract is said to convert raw hide and leather in one-sixth of the time, and at one-half of the cost.

The effect of the manufacture and export of hemlock extract will exhaust the hemlock forests at all accessible points and compel manufacturers to remove their tanneries into the rural districts to obtain a supply of bark, raise the price of bark, and consequently of leather, and diminish the quantity of leather produced.

For the protection of our hemlock forests it was suggested that the extract should be manufactured under a license upon Government land, an export duty charged on bark, and a considerable excise duty on extract manufactured for exportation.

An acre of good hemlock land would produce from ten to twelve cords of bark, worth from $30 to $36 delivered at the factory, at a cost, say, of $1 per cord for felling and $1 per cord for carting.

The cord of hemlock lathwood (128 cubic feet) is worth $8 at Montreal or Quebec.

The conclusion arrived at from this evidence was that our hemlock forests are being and have been rapidly depleted and destroyed, and that without proper care and forethought the language put into the mouth of the Indian many years ago (referring to stripping the soil of its trees) may in a degree become true—

"The realms our tribes are crushed to get,
May be a barren desert yet."

And the remedy seems to be that active measures be resorted to for select cutting, natural reforestation and planting, and systematic forestry management.

THE GEOGRAPHICAL DISTRIBUTION OF THE FOREST TREES OF CANADA.

In the report of the Geological Survey of Canada for 1880, there is a paper by Dr. Bell, the Assistant Director, accompanied by a map on which the general northern limits of the principal forest trees of Canada east of the Rocky mountains are represented. Dr. Bell says :—

The Continent of North America posesses a great variety of forest trees. About 340 different species occur within the United States. All the kinds which we have in Canada, amounting to about ninety, including those of the Pacific slope, are also met with in that country. Some species are not only very widely diffused, but are also persistent over great areas, being found almost everywhere within the limits of their distribution, while others, although having an extensive range, are nowhere very common, and are sometimes absent for a considerable interval. Others again are confined to comparatively small tracts. As a general rule, the more northern species occupy the greatest extent of country, while the southern ones are progressively more and more restricted, even in a more rapid ratio than would be implied by the narrowing of the continent from north to south; this is owing to the great differences experienced in climatic conditions in going from east to west in the more southern latitudes. Along the northern borders of the forests of the continent, the elevation of the land above the sea is comparatively slight, and regular, and the other physical conditions are tolerably uniform. As a consequence, we find the most northern group of trees extending from Newfoundland into Alaska, a distance of about 4,000 miles.

An inspection of the map accompanying Dr. Bell's report show some interesting features as to the general distribution of our forest trees, as well as regarding almost every individual species of timber. For example, it will be observed that there is no material change in the woods throughout the great triangular area, embracing about 600,000 square miles, of which the national boundary line between the Rocky Mountains and Lake Superior forms the base, and the Rocky Mountains and Laurentian Hills respectively the west and east sides, the apex being at the mouth of the Mackenzie River. In the southern part of of this area, a number of species are added to the kinds which everywhere throughout it make up the bulk of the forest; and again, few trees of any kind are found to the south of the North Saskatchewan; still, making allowance for local peculiarities of condition, there is a remarkable uniformity in the timber of this enormous area. It includes, however, only a few species, of which the aspen, balsam poplar, and willows are more abundant towards the western and the spruces, larch, balsam, fir and Banksian pine toward the eastern side of the area.

It will be observed that the lines marking the northern limits of about a dozen species turn southward and become their western limits on reaching the eastern side of the valley of Lake Winnipeg and the Red River; while the boundaries of the species occurring next to the south of these also manifest a tendency to turn southward in approaching the prairies of the west. The species above referred to are the white cedar, black ash, white pine, red pine, sugar maple, yellow birch, red oak, white ash, hemlock, beech, ironwood, red cedar (arborescent variety) and white oak. They are to a great extent replaced by other species before the region of open plains is reached. Had the great forests originally extended further west, and been destroyed by fire or other causes, in comparatively recent times, we should have found the northern limits of these species continuing their general course through the prarie regions, and ending abruptly

there, instead of which, they all curve gradually round, in a more or less concentric fashion, and other trees occupy the intervening ground. These well-marked features of forest distribution show that the present divisions of prairie and woodland are of very ancient date. The evidence of the smaller plants, and also of certain superficial geological conditions, all point to the same conclusion.

The State of Minnesota is situated in a very interesting region in regard to forest distribution. Here we find the northern limit of the group to which the most southern trees of Ontario belong, such as the black walnut, shell-bark hickory, hackberry, and Kentucky coffee tree; the north-western limit of the commoner trees of the northern states and of Quebec and Ontario, such as white oak, red cedar (arborescent variety), ironwood, beech, hemlock, white ash, rock elm, red oak, yellow and black birch, sugar maple, red maple, wild plum, etc. The western boundaries of some of the trees whose northern limits pass through Northern Ontario, such as the white cedar, black ash, white pine and red pine; the southern limits of the most northern group, including the white spruce, the large Banksian pine, balsam fir, balsam poplar and canoe birch; and the general eastern limits of some of the western species, such as the ash-leaved maple, green ash, burr oak, and cottonwood.

It will be observed that in Labrador peninsula the tree-lines tend northward midway between the eastern and western shores. This is due partly to the unfavorable influence of the sea on either side, and partly to the beneficial effect of the central depressions in which the rivers run northward into Ungava Bay.

From Mingan to Lake Superior, the height of land, north of the St. Lawrence, is rudely parallel to the general course of the lines marking the northern boundary of the trees. And it may have had some effect in limiting the northward range of a number of species. A southward curve in the watershed about the longitude of Ottawa is marked by a corresponding curve in the tree lines. Again, where a great depression occurs in this dividing plateau, some of the trees which in such cases may be approaching their northern boundaries, are found to extend, in the lower levels, beyond their general outline on either side. As examples of this the Lake Temiscaming and Abittibi District, and the valley of the Kenogami, or principal south branch of the Albany, may be mentioned.

On the Missinaibi, or west branch of the Moose River, the white elm reap- years, 130 miles north of its general boundary on descending to a sufficiently low elevation above the sea. The Saguenay, for about 100 miles from the St. Lawrence is really a narrow arm of the sea, and the country in the vicinity of Lake St. John at the head of the river, is only slightly elevated above its level and has a fertile soil, although surrounded by a mountainous region. Here we find an isolated colony of basswood, sugar maple and other trees, considerably removed from the rest of their species. On the north side of Lake Huron, and to the north of the City of Quebec, the land rises somewhat rapidly, and in both instances the tree lines near these latitudes are more closely crowded together than elsewhere.

Some kinds of trees, in approaching their northern limits, show a tendency to diminish gradually in size, and to become more and more scattered, rendering it difficult to draw any definite boundary of the species, while others vanish abruptly. The latter habit is more characteristic of southern than northern species so far as the Dominion is concerned. The various species appear to die out more gradually as they range northward in the western than in the eastern regions.

Forest trees east of the Rocky Mountains may be divided into four groups, as regards their geographical distribution within the Dominion.

1. A northern group, including the white and black spruces, larch, Banksian pine, balsam fir, aspen, balsam poplar, canoe birch, willows and alder. These cover the vast territory down to about the line of the white pine.

2. A central group of about forty species occupying a belt of country from the white pine line to that of the buttonwood.

3. A southern group, embracing the buttonwood, black walnut, the hickories, chestnut, tulip tree, prickly ash, sour-gum, sassafras, and flowering dogwood, which are found only in a small area in the southern part of Ontario.

4. A western group, consisting of the ash-leaved maple, burr oak, cottonwood, and green ash, which are scattered sparingly over the prairie and wooded regions west of Red River, and Lake Winnipeg.

In the western peninsula of Ontario the forests present a remarkable richness in the number of species to be found growing together. In some localities as many as fifty different kinds may be counted on a single farm lot. A more varied mixture is probably not to be met with in any other part of the continent, or perhaps in the world.

LEVELS OF THE OTTAWA.

The following tables from the reports of the Geological Survey (Canada show the levels at various points on the St. Lawrence, Ottawa and Mattawa rivers, from Three Rivers to Lake Nipissing.

Levels of the Ottawa above the waters of the St Lawrence at Three Rivers, which is about the highest point affected by the action of the tides:—

	Distance. miles.	Rise. ft. & in.	Total rise. ft. & in.	
Rise from Three Rivers to Montreal harbour. as stated in a report of the Hon. H. H. Killaly, President of the Board of Works in 1845	90	12.9	12.9	Montreal.
Rise from Montreal harbour to lake St. Louis at Lachine, from the same report:				
1 lock 13.3				
2 " 13.3				
3 " 8.6				
4 " 9.0				
5 " 0.9	10	44.9	57.6	Lachine.
Rise in lake St. Louis from Lachine to Ste. Anne	13	0.6	58.0	
Rise in the lock at Ste. Anne		3.0	61.0	
Rise in the lake of Two Mountains from Ste. Anne to Carillon	23	0.8	61.8	Carillon.
Rise from Carillon to Blondeau:				
1 lock, up 10.0				
2 " 11.0				
21				
3 lock down 13	4½	8.0	69.8	
Rise in Chute à Blondeau		4.0	73.8	
Rise in the Grenville canal from the head of Blondeau to the head of Grenville canal				
1 lock 3.0				
2 " 3				
3 " 8				
4 " 8				
5 " 7				
6 " 6	6½	35.0	108.0	Grenville.
Rise in the navigable part of the Ottawa, between Grenville and the entrance to the Rideau canal	58½	9.4	118.0	Ottawa.
Rise from the entrance of the Rideau canal to the Chaudiére lake, viz:—Rise in the Rideau canal to Dow's Swamp:				
1 lock 11.0				
2 " 10				
3 " 10				
4 " 10				
5 " 10				
6 " 10				
7 " 10				
8 " 10				
81				
Fall from Dow's Swamp to Chaudiére lake 18	6	63.0	181.0	Chaudiére.
Rise in Chaudiére lake from the foot to Fitzroy harbour at the head, supposed to be one inch per mile.	25	2.1	183.1	
Rise from Fitzroy harbour to Chats lake, as ascertained by levels taken up the Mississippi channel by the Board of Works in 1845, 49.96, say	3	50.0	233.1	Chats.
Rise in Chats lake from the head of the Rapides des Chats to the foot of the Chenaux, supposed to be one inch per mile	15	1.3	234.4	

Levels of the Ottawa above the waters of the St. Lawrence at Three Rivers.—*Continued.*

	Distance. miles.	Rise. ft. & in.	Total rise. ft. & in.	
Rise from the foot of the Chenaux to Portage du Fort, a strong current prevailing all the way, supposed to be 12 inches per mile	5	5.0	239.4	Portage du Fort.
Rise in the rapid at Portage du Fort		17.0	256.4	
Rise between the head of Portage du Fort rapid and the foot of the Sable, a strong current prevailing all the way, say one foot per mile	5	5.0	261.4	
Rise in the Sable rapid and two small ripples above.	0½	6.2	267.6	Sable.
Rise between the Sable and the Mountain Chute	1¼	1.0	268.6	
Rise from the boom at the foot to dead water at the head of the Mountain Chute, according to Mr. Gerrard Nagle		15.0	283.6	Mountain.
Rise from the head of the Mountain Chute to the foot of D'Argis rapid, say 8 inches per mile	1	0.8	284.2	
Rise in the D'Argis rapid		5.0	289.2	D'Argis.
Rise from the head of D'Argis to the foot of the Calumet Falls, say 8 inches per mile	1¼	0.10	290.0	
Rise in the Calumet Falls, according to Mr. Gerrard Nagle:—from dead water at the foot of the falls to the foot of the middle slide 26.3				
From the foot of the middle slide to dead water at the head 39.7	1	65 10	355.10	Calumet.
Rise from the head of the Calumet Falls to the head of the Calumet island, a considerable current prevailing the whole distance, say 6 inches per mile	13	6.6	362.4	
Rise from the head of the Calumet island to Fort Coulonges, including about 1 foot at La Passe rapid	5	2.8	365.0	Fort Coulonges.
Rise in Fort Coulonges lake from Fort Coulonges to the mouth of the Black river, quiet water all the way, say 2 inches per mile	8	1.4	366.4	Black river.
Rise from the mouth of the Black river to the Chapeau rapid, swift water, say 6 inches to the mile	6	3.0	369.4	
Rise in the Chapeau rapid		2.0	371.4	Chapeau.
Rise from the Chapeau to the Culbute, swift water all the way, say 6 inches per mile	5	2.6	373.10	
Rise in the Chute Culbute from the foot of the current to dead water at the head, according to the Board of Works		19.7	393.5	Culbute and lake Allumettes.
Rise from the head of Culbute rapid by Upper Allumettes lake and the Deep river to the foot of the Joachim Falls. The current in the deep river is so moderate that with a very gentle wind rafts are sometimes carried up stream without sails. The rise is supposed to be 2 inches per mile	32	5.4	398.9	Joachim.
Rise in the Joachim Falls from the Deep river to dead water at the head, according to Mr. Gerrard Nagle	1	23.3	422.0	
Rise from the head of the Joachim Falls to the mouth of Bennett's brook, say 3 inches per mile	4	1.0	423.0	Bennett's brook.
Rise from Bennett's brook to the mouth of the Riviere du Moine, a strong current prevailing most of the way, say 6 inches per mile	3½	1.9	424.9	Moine river.
Rise from the Riviere du Moine to the foot of Islet rapid, a strong current prevailing at Riley's clearing and at McSwirley's clearing, say 5 inches per mile	8	3.4	428.1	
Rise from the foot of Islet rapid to the Roche Capitaine rapids, or that part of them called the Maribou, allowing one foot for the Islet	1	1.5	429.6	Islet.
Rise from the head of Roche Capitaine	2	42.10	472.4	Roche Capitaine.
Rise from the head of Roche Capitaine to the foot of the Deux Rivieres, quiet water nearly the whole way, say 3 inches per mile	11	2.9	475.1	

Levels of the Ottawa above the waters of the St. Lawrence at Three Rivers.—*Continued.*

	Distance. miles.	Rise. ft. & in.	Total rise. ft. & in.	
Rise from the foot of the Deux Rivieres rapid to the head of the Levier rapid, viz :— Difference of level between smooth water at the foot and smooth water at the head of the Deux Riviere Portage....13.38 Difference of level between the heads of the Deux Rivieres Portage and the mouth of the Maganisipi .... 8.55 Difference of level between the mouth of the Maganisipi and the head of the Levier rapid 8.09	3	30.4	505.5	Levier.
Rise from the head of the Levier to the foot of the Mattawa rapids, being swift water nearly the whole distance, supposed to be 6 inches per mile.....	18	9.0	514.5	
Rise from the foot of the Mattawa rapids to the mouth of the Mattawa river..	1½	5.0	519.5	Mattawa.
Rise from the mouth of the Mattawa to the foot of the Cave rapid, a considerable current about mid-way up, say 4 inches per mile	2½	0.10	520.3	Cave.
Rise from the foot of the Cave to the head of the Chaudron rapid viz :-- Rise in the cave ....5.75 Rise in the Chaudron..... 6.00	¾	11.9	532.0	Chaudron.
Rise from the head of the Chaudron to the foot of the Erables rapid, say 3½ inches per mile.....	3½	1.0	533.0	
Rise from the foot to the head of the Erables rapid.	½	13.0	546.0	Erables.
Rise from the head of the Erables to the foot of the Mountain rapid, say 3½ inches per mile...	3½	1.0	547.0	
Rise from the foot to the head of the Mountain rapid.	¼	5.5	552.5	Mountain.
Rise in the Seven League lake from the head of the Mountain rapid to the foot of the Long Sault rapids, say 2½ inches per mile	17	3.6	555.11	
Rise from the foot to the head of the Long Sault rapids :— 1st or lower leap..... 6.92 Intermediate 1⅞ mile ..... 2.50 2nd leap .... 6.16 Intermediate 1 2-18 mile . ..... 2.20 3rd Crooked rapid..... 6.38 Intermediate 1 2-12 mile ..... 0.23 4th leap..... .....15.82 5th Upper rapid 8.34	6	48.5	604.4	Long Sault.
Rise from the head of Long Sault rapids to the mouth of the Opimika river above the Galere current; there is a perceptible current only in two places, say 3 inches per mile.....	12	3.0	607.4	Galere.
Rise from the mouth of the Opimika river to the head of lake Temiscaming, say 1 inch per mile....	55	4.8	612.0	Temiscaming.
Miles	492½			

Levels of the Mattawa from its junction with the Ottawa, 519 feet 5 inches above the surface of the St. Lawrence at Three Rivers, to Trout or Turtle Lake.

——	Miles.	Feet and inches.	Total.	——
Height above Three Rivers			519.5	
Rise from the mouth of the Mattawa to the foot of Plain-Chant rapids, including a rise of 1 foot 8 inches in 2 small rapids, allowing 4 inches per mile	2½	2.6	521.11	
Rise from foot to head of Plain-Chant rapids:				
1 rise		15.98		
2 "	½	1.90	539 6	Plain Chant.
Rise in Long lake from the head of Plain Chant rapids to the foot of Portage a la Rose, say 3 inches per mile	5½	1.4	540 10	
Rise from the foot of Portage a la Rose to the head of Portage du Rocher above Amable du Fond river:				
1 Portage a la Rose rise		5.90		
Intermediate		.20		
2 Portage de la Compagnie		5.80		
Intermediate		0.80		
3 Portage du Rocher		5.05		
	2	17.9	558 7	Du Rocher.
Rise from the head of Portage du Rocher to the foot of Portage des Parresseux, say 3 inches per mile in addition to a small fall of 4 inches	3¼	1.2	559.9	
Rise from the foot of Portage des Parresseux to the foot of the Talon or Hang falls:				
1 Portage des Parresseux rise		33.9		
Intermediate		0.25		
2 Portage de la Prairie rise		8.55		
Intermediate		0.95		
3 Portage rise		6.80		
Intermediate		0.10		
4 No Portage rise		3.34		
Intermediate		0.33		
	2¾	53.9	613.6	Foot of Talon.
Rise from the foot of Talon or Hang falls to the foot of Talon lake:				
1 Portage de Talon rise		42.23		
Intermediate		0.25		
2 No Portage rise		0.85		
	¾	43.4	656.10	
Rise from the foot to the head of lake Talon by the old canoe route, say 1 inch per mile	7	0.7	657.5	Lake Talon.
Rise from the head of lake Talon to the foot of Lower Trout lake, the difference of level ascertained by the new canoe route, the distance by the old route, viz:				
Rise from lake Talon to Lac des Pins		42.19		
Fall from Lac des Pins to Lower Trout lake		10.89		
	4½	31.3	688.8	Lower Trout lake.
Rise from Lower to Upper Trout lake, say 1 inch per mile in addition to a rise of 1.1 at the outlet of the Upper lake	3½	1.4	690.0	
Rise from foot to head of Upper Trout lake	8	0.0	690.0	Upper Trout lake.
	39¾			
Levels from the surface of Upper Trout lake, 690 feet above the waters of the St. Lawrence at Three Rivers, to the surface of lake Nipissing				
Height of Upper Trout lake			690.0	
Rise from Trout lake to the height of land between it and the Vase river on the canoe Portage	½	24.5	714.5	Height of land.
Fall from the height of land to the Riviere a la Vase, at the end of the Portage	¼	22.11	691.6	Vase.
Fall from Trout lake Portage, on the Vase, to lake Nipissing:				
Fall at 1st Portage		3.14		
Intermediate		1.00		
Fall at 2nd Portage		20.88		
Intermediate		1.50		
	4¼	26.6	665.0	Nipissing.

Levels from the surface of Lake Nipissing, 665 feet above the waters of the St. Lawrence at Three Rivers, to that of Lake Huron, at the mouth of the French River.

——	Miles.	Feet.	Total rise.	——
Height of lake Nipissing agreeably to the estimate of Mr. Wm. Hawkins in his report to the Commissioners of the lake Huron and Ottawa Survey in 1838, the falls on the French river are :—			665.0	
1 Chaudiere falls (upper) 10.0				
2 Chaudiere " (lower) 15.0				
3 Rapids 3.0				
4 " 3.6				
5 " 3.0				
6 " 8.0				
7 " 2.0				
8 " 3.0				
9 " 6.0				
10 " 3.0		56.6		
Allowance for the supposed general slope of intermediate parts of the river, say 6 inches per mile..	55	27.6	84.0	
To the level of lake Huron			581.0	
The ascertained height of the surface of lake Huron above the sea, according to the Michigan Surveyors is			578.0	
Making a difference of			3.0	

FOREST PROTECTION AND TREE CULTURE ON WATER FRONTAGES WITH THE VIEW OF PROVIDING A CONSTANT AND STEADY SUPPLY OF WATER, FOOD, SHADE, AND SHELTER FOR FRESH-WATER FISH.

At the conference of the International Fisheries Exhibition, London, on Wednesday, July 18th, 1883, a paper on the above subject was read by D. Howitz, Esq., Forest Conservator, and Commissioner for Denmark. It is in substance as follows :—

Professional foresters take a great interest in this question, as it is of much importance to the success of pisciculture, and to all fresh-water fishing. Its value may not at first appear so great as it really is, but it is sincerely hoped it may become a question of interest to all, and a special subject for future legislation. It is the question of the protection, proper management, and cultivation of forest and forest trees in localities where are found the sources of creeks, rivers, and a supply of water to lakes and other fresh waters. The greatest part of the forest land in Canada with which this question has to deal is in the possession of the State, but there are no laws in existence giving a guarantee for the preservation and proper management of these forests.

That the forests regulate the flow of the water in water-courses, and insure a steady supply during dry seasons, while they prevent sudden and disastrous floods, is a fact so often discussed and proved, that it need only be referred to here. There is still a great deal of uncertainty as to the extent of the effect of a forest on the rainfall, and it is only by very minute observations of forests, consisting of the same species of trees in various altitudes, that series of trustworthy results can be obtained. Still, there is no longer any doubt as to the effect of the forest in conserving the water that falls, or that the humidity of the air above a forest is considerably larger than that of the air of the open country. Experiments in the south of France showed that the rainfall in a forest, as compared with that in the open country, was in the proportion of 100 to 92.5, while the evaporation in the forest was only one-third of the evaporation in the open. The result of this is that the actual water received and retained from the atmosphere is nearly 50 per cent. greater in a forest than that received and retained by the plains. Numerous observations have also established the fact that the forests, as ready conductors of electricity, influence the current of vapours, and that their action is felt far above the actual height of the trees. Also that they condense the clouds into rain by lowering the temperature, and act as bulwarks against the severity of storms; all this we know by daily experience and observation. That want of forest protection may have most fearful results has been so often and sadly proved, and I need only remind you of the disasters caused by great floods and long droughts in Spain, South of France, Sicily, Chili, Peru, Mauritius, and many other places, and you will grant the importance of the question. In the Murcia Valley the river was reduced to a succession of stagnant pools, which durthe summer heat developed malaria, fever, and miasmatic exhalations, detrimental to life and health, and furnishing but scant and bad accommodation for the few remaining fish.

But as soon as the winter rains came, the river, in fact nearly all the valley, became a raging torrent, destroying life and property, and all because the forests on the ranges and mountains had been devastated, no legal restrictions protecting them. As a question of national economy; as a question of protection to life and property; and as a question of prosperity, forest protection has the greatest

claim to the attention of the Legislature. The forest, with its numberless roots and decaying vegetation, retains the rain water, and prevents it from rushing to the rivers and the sea, while it gives it off to these slowly and steadily. It acts like a great sieve and retains the fine particles of the soil, which the influence of the air and sun, the frost and rain, and the action of the numberless roots have decomposed, thereby fertilizing the land and forming a layer of mould or humus, in which insects, worms, larvæ, and other animalcules live and breed.

In his most interesting paper on fish diseases, Prof. Huxley said that drought or flood did not seem to affect the *saprolegnea*,* but that a steady flow was beneficial to the fish.

Mr. Wilmot, Superintendent of Fish Culture, Canada, in the discussion which followed, pointed out that the disease nearly always appeared where the regularity of the supply of water had been disturbed by the destruction of the forests.

I presume, therefore, that both these learned and practical gentlemen will agree with me in the importance of forest protection as a means of preserving the health of the fishes.

The branchlets, leaves, decaying and decayed vegetation, produce a vast amount of nourishment for the fish, and one most agreeable to them. Each breeze drops into the water numberless grubs, caterpillars, beetles, flies, and other insects, the food most relished by the fishes, while from the banks and roots worms and grubs are constantly supplying them with delicacies.

The shade of the overhanging trees is also agreeable to the fish, and one needs only to place a board in a stream and see the fish gather underneath it to be convinced of this.

We all know that a shady deep pool is a good place in which to seek for fish, and have often observed the predilection fish have for the shady side of a stream. But not only as regards fresh-water fishing can this be said. In Denmark it is a well-known fact, that the best fishing is where a forest is close to the shore, and in particular where the trees, as is often the case in that country, overhang the very sea. The shadowing trees have another, and, perhaps, the far more important effect of preventing a large evaporation, and at the same time, keeping the water clear and cool in summer, while on the same account the winter frosts do not deal so severely with them. In all forest country the changes of temperature are not so severely felt as in a treeless country or on the open plains, and the effect upon the water is even greater. It is a popular saying in Denmark of the forest streams, that they are cool in the summer and warm in the winter, this, of course, meaning that they present that feeling in comparison to the atmosphere. The forests not only regulate the flow of the water, but they purify the water. This is an experience often demonstrated in Australia in cases where streams have been polluted by wool-washing establishments. After having passed a few miles through a shady and dense forest, the water will appear as clear and pure as it was above the woolwash.

I need not here enter upon more reasons for the conservation of existing forests to insure a steady supply, or to draw your attention to the danger in not protecting them by legislation. But I will draw your attention to the advisability of cultivating forests on places suitable for the supply of water, and especially along water courses and lakes, as means of purifying these, preventing too great

*A fungus or mould.

evaporation, supplying food for fish, and providing these with shade against the rays of the summer sun, and shelter from the pelting rains, the hail and the tempests.

Salmon fishing and all fresh-water fishing depend upon proper attention to this matter, and I feel certain that if the true causes were properly investigated where fish were said to disappear from a stream, in half the cases it would be found that the shade and shelter of the forests or protecting border trees had been taken away. It was said at the reading of Sir James Gibson Maitland's excellent paper on the "Salmonidæ" that it was not enough to place spawn and fry in a water; they must be provided with proper food, and the best means to do this is to preserve the border trees and insure a steady supply of water and food by preserving the forests from whence the supply of water is derived. But, as before remarked, it is not enough to preserve the present forest. New forest must be cultivated on the barren ranges, and many a stream, now nearly empty during dry seasons, will be refilled and soon teem with fish and food for the many. So far for the principle of the conservation of the forest.

I will now briefly mention the most suitable trees and their culture. But, before entering upon this, I must draw your attention to the important condition to be observed in the management of such forest areas as are preserved for the sake of conservation of water. This condition is density. In the dense shade of a well closed forest are developed all these atmospheric conditions on which depend the greatest effects of the forest in regard to climate and water conservation. The so-called periodical thinning out in these areas should be carried on with the greatest care, and might with advantage be nearly dispensed with, if the economy of the management would permit it. The result would be, besides the effect on the water conservation, that tall straight trees would be reared, yielding timber most valuable for all practical purposes. Nature itself would do the thinning out, and do it in a better way than we could hope to do, while the ground would be kept moist and in a state favorable to the decomposition of vegetable matter. It is desirable, therefore, to frame regulations regarding such forests, deciding the minimum to be preserved of the number of trees per acre, due regard being, of course, paid to age, species, altitude and locality. For these reasons it is highly important that all such forests, whether private property, commons, or belonging to the State, should be placed under the control of the State.

The different trees have naturally a different effect as regards conservation of water and production of food and shelter for fish, as I will here briefly point out. To simplify matters, we may divide all forest trees into two large groups, the deciduous and the evergreen trees. The deciduous trees, of which, so far as Great Britain is concerned, the oak, elm, beech, plane, larch, willow, and poplar, are the most prominent, have a decided advantage over the evergreens. I need not here enlarge upon the fact that the full shady foliage during summer is far more effective in preventing a large evaporation, and that the branches of the trees of this group are more spreading than those of the other. The energy of life seems to be far greater in these trees towards effecting our objects, and, for direct border trees to a water, they are undoubtedly the best suited. The great amount of foliage and branchlets yearly thrown by these trees forms a prominent factor in the economy of nature, and their decaying vegetation is full of teeming life and food for fish.

That this group is eminently suited for water conservation, was illustrated in a forest in Denmark, where an area of firs and pines was cultivated with beech and oak. After a lapse of about fifteen years, a mill stream, which, during the

time of the evergreen trees, had dwindled down considerably, assumed such proportions that the irrigation of a considerable area was affected by it, besides supplying the mill with an abundance of water. As regards the evergreen trees, the first cultivation of barren ranges on high plateaus might advantageously be undertaken with these, on account of their ability to resist the severity of the climate in those exposed localities, and to grow on stony and poor soil. But, even on rocky ground and in high altitudes, the larches, birches, and other deciduous trees, will often do well and serve better for the end which we have in view, the water storage and the pisciculture.

In such localities, where only the most hardy trees can be reared, it would be practicable to cultivate along the watercourses, in the valleys and ravines, or any lower ground, a few rows of deciduous trees as soon as the other trees had attained sufficient height to protect them from the storms and the frosts. Several objects may be gained by doing so. First, the shade, shelter, and other beneficial effects for the fishes; secondly, that more valuable timber could be reared, as these trees have, as a rule, a greater preference for damp and moist localities than the evergreens; and thirdly, because the deciduous trees permit more freely a luxuriant undergrowth of shrubs and annuals.

All fresh-water fishermen will agree with me in the advantage of having a good growth of annuals, as watercress, nettles, etc., near the bank, and have observed that during feeding time the fish always seek such places. There is a vast variety of shrubs and annuals that might easily and with great advantage be introduced and grown on the river banks, but it would be outside the bounds of this paper to enter fully on the theme. However, I may only mention that many fodder plants and grasses from other countries might be a source of wealth to the population, and greatly benefit the fish as well as the owners of the land, if cultivated on the banks.

The Prickly Comfrey, *e. g.* (*Symphytum asperrimum*) which yields such a splendid forage by its abundant foliage, and many others, are easily reared, both from seed and cuttings, and should do well in the low lands, while on the sandy beaches, near the outlet of rivers and creeks, the cabbage radish (*Pringlæ antiscorbutica*) would cover these barren and desolate places with vegetation, and furnish an object of merchandise by packing them for the use of fishermen and sailors in the Arctic regions. The plant, when cooked, is a good substitute for cabbage, and has a most wholesome effect on persons suffering from scorbutica.

By a judicious forest management, the land can be kept covered constantly and always in a state favorable to the purpose of storing the water, but it is important that both sides of the stream should be planted instead of cultivating twice the distance on one side. A great many American trees might well be introduced, as, for example, the Swamp Cypress (*Taxodium distichum*), a great tree yielding a fine-grained timber, hard and durable, and the Leverwood tree, Hop-hornbeam, Ironwood (*Ostrya virginica*), which, besides excellent timber, furnishes a relished forage from its rich foliage: these, and a great many more might have a good effect on the river fishing, besides other advantages But it is particularly the willows to which our attention should be drawn. The preference which these trees have for water, and particularly for running water, is well known, and points directly to the practicability of placing them in those localities so well suited for them. The fish like willows, and I have oftentimes in Australia seen the best fishing places close to where some weeping willows (*Salix babylonica*) had taken the place of the indigenous and even more shady wattles (*Acacias*).

The yearly consumption of osiers in England is far greater than the national supply, and as the basket industry is constantly on the increase, it would also on this account be advisable to further the cultivation of the osier willows. For light, sandy banks, the best willow should be *Salix purpurea*, and as it is so easily propagated, it will well repay the cost of cultivation, besides binding the banks, making them firm and adding to the health of the locality as well as that of the water. For more clayey soil, *S. viminalis* and the more celebrated *S. capræ*, so much sought for powder factories, should be the best. The cuttings must be taken from the one to two-year-old shoots, and be put 1 to 1½ foot apart, in double or treble rows 2 to 3 feet apart, care being taken to leave only half an inch or less above ground.

There are many localities where comparatively valueless land, close to the mouths of rivers and canals, might be made highly profitable, at the same time as the cultivation of it with the before mentioned trees and plants would improve the state of the fishing, and, before placing spawn and fish in any water, I consider it important to pay great attention to this question. Where few or no trees exist it will be necessary to cultivate them, and I feel certain that such proceeding will enhance the chances of the success of pisciculture. I will not here enter further upon the practical details of the question. These are bound to vary with the locality, and the local foresters will know how to deal with them.

In drawing the attention of the conference to this question, it is with the sincere hope that it may enlist your sympathy, and that the public opinion may be won for it. That it is important for all fresh-water fishing is evident. That is one more reason added to the many why we should regard the forest as a precious heirloom to be deeply revered, properly used, and, through careful maintenance, descend improved and enriched to posterity.

SYSTEMATIC MANAGEMENT OF FORESTS.*

The Model Forest.

Imagine a uniformly productive tract, divided into any number (n) of divisions, or compartments of equal area; the first stocked with trees one year old, the second with trees two years old, and so on in an ascending series up to the *nth* compartment stocked with trees n years old. And let the revolution or age at which the trees of any compartment are to be cut, be n years. The land will then be parcelled out into a number of compartments equal to the number of years in the revolution and each one will be stocked with trees one year older than those of a compartment immediately proceeding it in age, so that there will be a complete series of groups of all ages from one to n years old If, now, all trees n years old, that is those in the *nth* compartment, be cut, and the land immediately restocked with young growth, it is evident that, at the end of twelve months, the group of trees next in order of age, or n minus one year at the time of the first cutting, will have advanced to maturity, while the plants on the first coupe will have taken the place of the youngest group in the series, and the plants of all intermediate compartments have advanced one year in age. At the expiration of twelve months from the time of the first cutting, we may therefore again cut a group n years old, and so on forever, cutting a group n years old once a year without demolishing the standing stock.

The yearly produce thus obtained is, in fact, the annual growth, or interest, of the material standing on n compartments, and is called the sustained yield, and a forest so organized is called a *model*, or ideal forest, because it represents a state of things which is theoretically perfect, if never quite attainable in practice.

If, in the case just considered, we were to cut more than the sustained yield in any year, we would be trenching on the capital stock and unable to maintain an unvarying yield. If on the other hand, we were to cut less, we would not be working up to the full capability of the forest and would have a certain amount of capital, in the form of trees, lying idle, and for the time being unremunerative.

A forest may, therefore, be regarded in the light of a capital producing by its yearly growth a certain interest in wood, just as a sum of money which is lent out produces interest; and, in estimating the growth of a forest viewed as a productive money capital the rate is calculated in precisely the same way as in ordinary money transactions.

Trees of about the same age and height, growing together in a mass, or trees growing in a sub-compartment are called a *group*. A compartment may contain one or more groups; if more than one, the area occupied by each group is called a sub-compartment. The group is the smallest unit of mass, and the sub-compartment is the smallest of area, in regular forests.

The Revolution.

The term *revolution* is used to donate the period of years which is being *fixed* to elapse from the time of the production of a tree, or group, to the time of its being cut down. It does not necessarily correspond to the age at which a tress is harvested, because trees sometimes have to be cut, or fall from natural causes, before the revolution fixed upon is completed.

* Macgregor; Organization and Valuation of Forests.

The length of the revolution may depend on many things; such as the kind of tree, and the method of regeneration to be followed—subjects which are fully examined in books on sylviculture—and the special objects of the proprietor.

The principal objects of the latter may be classed as follows:—

To obtain from the land the largest possible average annual return, (1) of material, (2) of money, (3) of interest on his capital invested; or, to adopt the revolution best suited to (4) natural regeneration, or some (5) special, technical purpose. Revolutions fixed with a view to make such special requirements are called, respectively:—The revolution of the largest mean yearly yield, (1) in wood and (2) money, (3) the financial revolution, (4) the physical, and (5) the technical.

Choice of a Revolution.

For private owners there can be no doubt as to the most favorable revolution—the financial. But when it is a question of forests belonging to the State, it is frequently urged that cost what it may, it is the duty of a government to provide for all possible requirements of the community, and to prevent a diminution of the supply of any kind of material. No doubt a good deal may be said in favor of this view. In the first place, it is undeniable that forests that can be cut down any day may take years or even centuries to replace, and that it would never do to rely on private enterprise for the supply for the largest timber, more particularly as it seldom pays to grow it. Again, experience teaches that private individuals cannot be relied upon to provide even small timber, or fire wood, which *does* pay; the temptation to exceed the capability of the forest, or to convert all the standing stock into gold, whenever money is required by the proprietor, is irresistible, and not to be restrained by other people's ideas of moral obligations to themselves and posterity.

Now, without denying that circumstances (as in the case of protective forests) are conceivable which would render it advisable for a State to keep a forest standing after it had reached financial maturity, advocates of the financial revolution may reply as follows:—As a general rule, it is the business of a government to make the most of the property entrusted to its charge, rather than to anticipate and provide for highly improbable contingencies which, if they ever did threaten to arise, would certainly not in these days take everybody by surprise.

The government timber forests of all civilized countries are of vast extent, Spain perhaps alone excepted. They are are all systematically managed, or in a fair way to be so, and could not therefore, be swept away as if by magic, nor the standing stock suddenly reduced to a great extent, because that would involve the sale of largely increased quantities of wood, which could not be quickly disposed of without greatly depreciating its value. In a well-regulated forest, therefore, the financial revolution would act as a self-adjusting measure of the requirements of the people, and act as a regulator of the supply in sympathy with their most pressing wants.

Natural Regeneration of Woods.*

In forests naturally regenerated by seed, the mother trees are only gradually removed, and several cuttings go on at once. In every rational method of working a forest, reproduction ought to be the result of the cuttings themselves.

*Bagneris: Elements of Sylviculture.

This is one of the essential objects of the science and art of sylviculture. Thus in the different kinds of high forest, reproduction is obtained from seed shed by the trees under conditions favorable to germination, while in coppices it is obtained just as naturally, by means of the shoots principally and secondarily by means of the seeds furnished by the standards.

But whatever the precautions taken, in both descriptions of forest there are often spots where seedlings do not come up, or where stools die and leave blanks. At other times it may happen that the reserve does not contain a sufficient proportion of a given species, a mixture of which is necessary, or that this species has disappeared owing to indiscreet operations or the total absence of all operations. In each of these different cases recourse must be had to artificial means in order to restore the good condition of the forest or a satisfactory composition of the crops. But such means ought to be the exception not the rule. It cannot become general and take the place of natural methods. To abandon natural reproduction is only to retrograde, to return to the infancy of the art; it is tantamount to claiming to supersede the forces of nature; above all it is simply wasting money under the false idea of economy, only to arrive in the end at results which are at the best doubtful.

Nevertheless, artificial restocking cannot be totally proscribed. It forms the necessary complement of natural regeneration, but it must remain only its complement. Hence it is necessary for the forester to know how to do it well. Besides this, it is the only method of stocking extensive treeless wastes.

Regeneration by Seed.*

Regeneration by seed is applicable to all species; that by shoots and suckers applies only to broad-leaved species; since the power of reproduction of conifers by shoots is either absent altogether, or so feeble that it is useless for sylvicultural purposes.

Under natural regeneration by seed is understood the formation of a new wood by the natural fall of seed, which germinates and develops into a crop of seedlings. The trees which yield the seed are called the *mother trees;* they may either stand on the area which is to be restocked, or on adjoining ground. A distinction is made between—

(1) Natural regeneration under shelter-woods;

(2) Natural regeneration from adjoining woods.

In natural regeneration under shelter-woods the area is stocked with seed-bearing trees, and the new generation springs up under their shelter; for some time at any rate, the area bears the new crop and part of the old one.

The system is that which occurs in primeval forests. When a tree falls from old age, or other cause and an opening is thus formed in the cover overhead, the seed falling from the adjoining trees germinates and develops into seedlings; these grow up under the shelter of the older trees, until they in their turn become mother and shelter trees. In this manner primeval forest, if undisturbed, goes on on regenerating itself for generations. The process is a slow one, as the young crop will only develop when sufficient light is admitted by the fall or death of the old trees. In sylviculture it is accelerated by the artificial removal of a

* Schlich: A Manual of Forestry.

portion of the old trees, when they have become fit for economic purposes. By degrees, modifications have been introduced which lead to a number of distinct methods :—

(1) *The selection system.*

(2) *The group system.*

(3) *The compartment system.*

(4) *The strip system.*

In each of these there are certain general conditions of success which hold good for all.

Under the selection system, regeneration goes on in all parts of the forest by the removal of the oldest, largest, diseased or defective trees, wherever they are found. No part of the forest is ever at rest; advantage is taken of all seed years for the restocking of small holes cut into the cover here and there by the removal of one or a few trees. Of the large quantities of seed which fall annually or periodically to the ground, only a small portion finds conditions favorable for the development of young trees; the latter are found chiefly in those parts where old trees are standing, or where the cover has been interrupted. Here little groups of seedlings spring up, which must be assisted by cuttings either final or intermediate, to afford them the necessary light.

Choice Between Direct Sowing and Planting.

Formerly the artificial formation of woods was chiefly effected by direct sowing, planting being restricted to special cases where the other method was not likely to succeed. The reasons for this were that sowing was considered to be more certain, cheaper, and that it was generally the custom to use too large transplants. In the course of time the raising of plants was elaborated, smaller plants were used, and the expense considerably reduced, so that now far more planting than direct sowing is done.

Yet it is not always a foregone conclusion that planting is better or more suitable than direct sowing, since many different conditions and factors affect the ultimate results. The effect of some of these factors is as yet somewhat obscure, but in many respects experience has taught the forester which of the two methods is preferable under a given set of conditions.

Sowing and planting are costly. The outlay on the latter can, however, be considerably reduced by planting small plants according to a simple and cheap method.

Where artificial regeneration follows clear cutting, the young plants are exposed to damage by frosts, drought, insects and weeds in a far higher degree than if the regeneration is conducted under a shelter-wood. In fact, tender species must be raised in the latter way, so that for them clear-cutting is excluded. Insects frequently become formidable to coniferous woods raised in clear-cuttings, while experience has shown them to be less dangerous to natural seedlings, especially when these are raised under a shelter-wood.

In the case of clear-cuttings, the laying bare of the ground for a series of years may seriously affect the fertility of the soil, so much so that the method is hardly admissible on inferior soils.

Natural regeneration involves less expenditure than sowing or planting. In some cases the outlay may be absolutely *nil*, but in most cases some artificial help has to be given either by working (wounding) the soil, or by sowing and

planting. Still the outlay is considerably smaller. It must, however, not be overlooked that in the majority of cases natural regeneration requires much time; as long as the shelter trees increase sufficiently in size and quality so as to make up for any loss on this account no harm is done, but where this is not the case artificial regeneration may be actually more profitable.

Damage by frost, drought, and weed growth is avoided, or at any rate considerably reduced. The same may be said as regards damage by insects, though perhaps not to an equal extent.

Summing Up.

Neither the artificial nor the natural method of regeneration is the best at all times and under any circumstances; only a consideration of the local conditions can lead to a sound decision as to which is preferable in a given case. In forming such a decision the forester must chiefly take the following points into consideration:—

(*a.*) General objects of management.

(*b.*) Species to be grown.

(*c.*) Condition of locality.

(*d.*) Available funds.

(*e.*) Skill and capacity of the staff.

Labor Required in Forestry.

Forests require labor in a great variety of ways, which may be brought under the following three headings:—

(1) General administration, creation, tending, harvesting, etc., or work done in the forest.

(2) Transport of produce.

(3) Industries which depend on forests for their prime material.

(1) *General Administration.* The quantity of labor required in the forests differs considerably according to circumstances, the value of the produce, and the consequent degree of the minuteness of the system of management. Great difficulty is experienced in obtaining accurate statistics on this point, but five days' work annually for every acre of land under forest may be accepted as an approximate estimate all round. From the available data it has been calculated that in the forests of Germany about $39,000,000 are paid annually for administration, creation, preservation, road making, cutting of wood, and collection of minor forest produce, on which about 200,000 families exist, or about 1,000,000 people. This estimate refers to forests which are already in existence, and in which fencing is done only in very rare instances. When new forests are created, additional labor is required at the outset. Nevertheless it is beyond doubt that forests require considerably less labour than land under field crops.

(2) *Transport of produce.* Owing to the bulky nature of forest produce its transport forms a business of considerable magnitude. Timber and firewood are carried by water wherever practicable, but also extensively overland. Under this head the sum of at least $19,480,000 is paid annually in Germany.

(3) *Forest industries.* The labour which is required to work up the raw material yielded by forests is of a much greater extent than that employed in managing the forests and in transport. There are the workmen employed in

saw-mills, building, ship-building, carpentry, coach-building, engineering, turning, carving, paper pulp manufacture, match-making, the manufacture of cases, and boxes, round and square, from the largest packing case to the smallest toy box, frames of sieves, drums and cask hoops, wooden-ware for table covers, blinds, pencils, wooden nails, instruments, tools, plates, shovels, spoons, shoes, lasts, saddle-trees, brushes, harrows, and gunstocks, toys of thousands of patterns, and endless other branches of industry, some of which can only exist in and around forests.

The wages earned under this head amount in Germany to something like $146,100,000 a year, maintaining 600,000 families or 3,000,000 people.

Taking now the three heads of labour together, it has been estimated that something like 12 per cent. of the population of Germany is employed in forest work, transport of forest produce, and the working up of the raw material yielded by the forests. An important feature of the work connected with the forests and their produce is, that a greater part of it can be made to fit in with the requirements of agriculture; that is to say, that it can be done when field crops do not require attention. Hence forest work offers an excellent opportunity to the rural labourer or small farmer of earning some money when he has nothing else to do, and when he would probably sit idle, if no forest work were obtainable.

Organization of the Personnel.*

This will depend in a great measure on the extent of the forest concerned. It is evident that the degree of division of labour which is possible in the management of forests comprising a million acres could not be applied with advantage to an estate of a thousand acres, and that private individuals will seldom be in a position to adopt the elaborate systems followed in the State Forests of European countries.

The following plan is that usually adopted for the management of forests of large extent, such as those of most European countries.

The establishment consists of an inferior and a superior branch. The former consists of (1) guards and (2) rangers.

(1) *Guards or Under-Foresters.*—The duty of these is, as the name implies in the first place, protective. But, besides this, they are employed in the executive work of their beats, as, for instance, in supervising work of regeneration and felling.

(2) *Rangers,* or, range-foresters, who have immediate charge of the executive work of a *range,* and are responsible for its proper conduct to the assistant conservator.

The superior branch consists of (1) Assistant-Conservators, (2) Deputy-Conservators, (3) Conservators, and, in certain cases, of (4) an Inspector-General.

(1) *Assistant-Conservators.*—An assistant-conservator has charge of several ranges, called collectively, a *sub-division.* Besides the general management of the work of the sub-division, the accounts of each range are audited, and have to be passed by him before payment is made.

(2) *Deputy-Conservators.*—A Deputy-Conservator has charge of several sub-divisions, called collectively, a division. His duty is purely to control, and he does not, as a rule, interfere with the executive work of the Assistant-Conserva-

* Macgregor ; Organization and Valuation of Forests.

tors; but it is his business to see that the general provisions of the sanctioned working schemes and yearly budget of his division are properly carried out, and to audit and pass the accounts of the sub-divisional officers.

(3) *Conservators.*—A Conservator has general control of several divisions, collectively called a *circle*, comprising all the forests of the State, or, if they are very extensive, of a Province only. He is the immediate adviser of government in all forest matters concerning his circle; holds in fact, in this respect, much the same position as an under-secretary of State, and usually has his headquarters at the seat of Government.

(4) *Inspectors-General.*—An Inspector-General stands in the same relation to a supreme government as a conservator to its local government, and exercises a general supervision over the whole system of a country.

It will be observed that by this system the administration is divided into an executive and a controlling branch, the former consisting of Assistant-Conservators and their subordinates, and the latter of Deputy-Conservators and officers of superior rank.

Members of the inferior establishment do not, as a rule, rise higher in the service. A much lower standard of technical and general education is demanded from them than from the members of the superior branch, and they are, therefore, generally unfitted for the higher appointments.

The size of ranges, sub-divisions, divisions, or circles, depends on local circumstances, such as the degree of intensiveness of the working, compactness of the forest area, mode of treatment and means of communication. It is, for instance, evident that, other things being equal, a Deputy-Conservator could manage a larger division where there was railway communication than where there was none. It is equally obvious that a ranger could manage a much larger forest worked by the method of equal areas, and solely with the view to producing firewood coppice, than a seedling forest worked by the combined method with a view to the production of large timber and naturally regenerated.

Choice of an Organizer.

Should the sub-divisional officer who has been in immediate charge of the forest, perhaps for many years, be intrusted with a preparation of a plan, or should a special branch of the executive be employed, whose sole business is to prepare plans of management?

In regard to this question, opinions are divided. Of course it is one which can only arise in regard to large tracts of forest belonging to one proprietor—the State for example. A small proprietor would not be able to keep a special staff fully employed.

It has been urged in favor of the local officials conducting the organization and revision of a forest, that he must know the special conditions far better than other people, and that he would take much more interest in the carrying out of his own programme than that of another.

On the other hand, it has been maintained that the special practical knowledge and skill necessary to organize a forest successfully cannot be acquired in the ordinary routine of an executive officer, who would probably not be called upon to carry out a work of this kind more than a few times during his whole career; that by constant practice a special branch would attain the necessary proficiency; that if the work is done by a small body of men, it is more likely to

be uniformly carried out than by a number of different persons; that the officer in charge is not the proper person to revise his own work; that he will be always there to assist and advise the organizer.

A large majority of countries, including India, have adopted the system of having works of organization carried out by a separate branch of the service; and some have gone still further and constituted a distinct survey branch as well as an assessment branch. As a rule the separation of these two departments is not desirable. Perhaps it conduces towards efficiency, if a part of the staff is exclusively employed in surveying and the other in assessment, but the work of the two is so intimately connected that it is expedient they should both be under one head.

The composition of the organization staff depends on special circumstances Sometimes a good plan is to have a board of senior officers, presided over by the principal officer. All organization schemes are submitted for the approval of, and have to be passed by, this board, the members of which carry on the work in addition to their ordinary controlling duties. Under the board is the working staff, which carries out the works of organization, and which is recruited by drafting men into it from the ordinary branch of the service after they have served a few years and become thoroughly acquainted with the working of a sub-division.

This system is only suitable for districts in which the headquarters of the controlling officers on the board are all in one place. Each member looks specially after the working of the plans in his own division, and generally conducts the revisions in person.

An important duty of the organization branch is to collect and work up statistics. The business of collecting statistics and drawing general inferences is best done by a central institution of this kind, and much useful work would often be lost without a trained staff, whose special duty is to work up details collected in different parts of the country; the "Bavarian tables," which have proved so useful, not only in Bavaria, but throughout Germany, are a case in point; they would probably never have been constructed if there had not been a central organization department at Munich.

Speaking generally, the bent of the argument appears to be in favor of having this kind of work done by a special branch; but not always, as circumstances may without doubt arise which render the alternative course advisable, as, for instance, when the aggregate area of forests requiring to be organized is so great that their organization could not be accomplished within a reasonable period by a necessarily limited staff, or when the methods to be employed are so simple that their execution does not require any special skill.

FORESTRY IN THE COLONIES AND IN INDIA.*

A circular containing questions relating to colonial timber was addressed by the Secretary of State for the Colonies to the administrative heads of the various British possessions in 1874, from the replies to which it appears that in none of the six Provinces of the Dominion had measures been taken to secure the replanting of cleared areas, or the afforestation by natural reproduction, notwithstanding an enormous and growing consumption.

In the Province of Ontario more than 87½ per cent. of the timber annually cut was exported, and, looking to the magnitude of the timber exports, it was remarkable that so little had been done to prevent the threatened exhaustion of the chief article of trade in the Province.

In Nova Scotia the amount of timber annually cut was estimated to exceed by 25 per cent. the amount which could be cut each year without permanent injury to the forests, while in Prince Edward Island the amount annually cut exceeded nearly seventeen times the quantity which would represent a prudent rate of consumption.

The timber resources of British Columbia were declared by local authorities to be practically inexhaustible, but it is probable that, should the whole strain of the demand be thrown upon British Columbia, a few years would make a very perceptible inroad upon the stock of native timber situated in accessible districts of the Province.

The importance of this trade to the commercial prosperity of the Dominion will be exemplified by the following table, compiled from materials contained in returns issued by the Board of Trade.

Comparative tables of money values of timber and corn (grain) exported to the United Kingdom during five years ending 1876.

Articles.	Value.					
	1872	1873	1874	1875	1876	Total.
	$	$	$	$	$	$
Timber and wood	4,218,661	5,220,256	5,706,567	4,205,045	5,282,657	24,633,226
Corn and grain	3,003,104	3,898,204	3,697,616	3,124,056	2,814,003	16,536,983

Timber and corn (grain) are the chief exports of the Provinces of the Dominion, but the value of the timber exports exceeded the value of the corn exports by more than one-third, and constituted nearly one-half of the total value of all the exports from the Dominion to the United Kingdom.

The returns exhibit, in a striking manner, the urgent need for some prompt and comprehensive action to stay the influences at work to destroy the indigenous forests, which constitute, in many instances, the principal natural riches of the colonies. There is a tendency in newly-settled countries to regard the timber as

* Schlich : In Proceedings of Royal Colonial Institute, vol. xxi., 1889-90.

a mere encumbrance to the land, and the finest timber is that first selected for destruction by fire, by ring barking, and other rude and wasteful methods in favour with settlers.

It is probably not possible in newly-settled colonies to put restraints upon the clearing of the most fertile soils, although it would seem to be advisable to leave belts for protection against the winds, and to enact that all the hills should be preserved in perpetual forest to protect the sources of the springs.

In many cases the reports of surveyors-general and other officials demonstrated the possibility of preserving, and even of restoring the forests, by the constitution of a small but energetic forestry department, but nothing worthy of notice had, up to the date of these returns, been done in the nature of forest conservation.

New Zealand.

The subject of forest conservation appears first to have engaged the attention of the Colonial Legislature in October, 1868, when a motion was made and agreed to that "steps be taken to ascertain the present condition of the forests of the colony."

In the course of a parliamentary debate in 1873, it was remarked, with reference to the Kauri wood, that extensive districts which were once covered with that wood were then totally destitute of it, and that its extermination progressed from year to year at such a rate that its final extinction was as certain as that of the natives of New Zealand. Another speaker maintained that "unless great care was taken, there would not be a Kauri tree in the colony in the next generation.*

As the result of the agitation of this question, an act was passed by the colonial Legislature in August, 1874, entitled "An Act to provide for the establishment of State forests, and for the application of the revenues derivable therefrom." The preamble recites that "it is expedient to make provision for preserving the soil and climate by tree planting, for providing timber for future industrial purposes, for subjecting some portion of the native forest to skilled management and proper control, and for these purposes constitute State forests."

The Act provides that an annual sum of £10,000 for thirty years is to be paid quarterly out of the Consolidated Fund into a special fund, to be called the "State Forests Account," and all receipts from State forests are to be paid into this account. The money is to be expended in managing and planting State forests and nurseries, and the establishment of schools for instruction in forestry. The department is placed under the supreme control of a minister of the Crown, who is to be assisted by a "conservator" and subordinate officers. Lands may, from time to time, be set apart as State forests on the recommendation of the superintendent or of the Provincial Council of any Province. Power is taken to set aside pastoral leases or licenses over lands so selected.

The Governor-in-Council may make, alter, and repeal by-laws and regulations—

Prescribing the duties of officers.

To regulate the form and issue of licenses.

*Kauri, *Dammara Australis*. A Conifer, the largest and most valuable tree in New Zealand. Attains a height of 120 feet and diameter of 10 feet to 15 feet Grows in Province of Aukland only. Exudes large quantities of resin, known as Kauri gum. Weight, 38 lb. to 41 lb per cubic foot; grows on clay soils. The above remarks as to the "Kauri" will apply to our most valuable hard-wood tree (the Black Walnut).

To control the management of the forests.

To determine the seasons for the cutting and removal of timber and bark.

To prevent waste and unnecessary destruction.

To prevent the danger and spread of fire.

To prohibit trespass and regulate access.

For constructing roads and tramways in the forests and charging of tolls.

The Act also provides for the punishment of offenders and for the application of money recoverable as penalties.

As a practical and comprehensive experiment in the direction of forest conservancy, the results were looked forward to with interest.

Australia.

Australia proper consists of the colonies of New South Wales, Victoria, Queensland, South Australia, and Western Australia. The causes which determine the climate of Australia are remarkable in many ways. In the first place the northern parts of the country are situated in a tropical, and the southern parts in a temperate latitude. Secondly, between the two stretches the enormous central plain is daily heated in summer to a very high degree, the air expands, is lifted, and flows away on all sides, causing an indraught of moist sea air. This is forced to rise on reaching the high coast lands, which it moistens in various degrees. Owing, however, to the great distance from the shore to the centre of the country, the latter profits only at regular intervals by this, because the indraught is regularly stopped by the nightly radiation of the heat absorbed during the day, or the clouds are once more converted into vapour owing to the high temperature of the air.

Such is the heat of the interior during the summer that the air, if it moves at all, feels like a furnace blast. Sometimes, however, sufficient masses of clouds succeed in passing over the coast ranges, and, in such cases, floods of rain fall upon the inland country. The distribution of the rain differs considerably. The north coast has the advantage that the air drawn in from that side comes from the equatorial regions, the great reservoir of moisture.

Then the hills on the east coast are comparatively high, those on the west coast are lower, and along a portion of the south there are no mountain ranges at all. Thus it happens that the rainfall at the head of Spencer's Gulf is only 6 to 8 inches; at Adelaide, 20; Melbourne, 26; Portland, 32; Sydney, 48; Newcastle, 44; Brisbane, 49; and at Rockingham Bay, something like 90.

In every part, however, the rainfall decreases rapidly in passing inland, so that comparatively little falls on the inner slopes of the coast ranges.

The temperature depends on the situation and the rainfall. The northern part of the continent is tropical. Brisbane has a mean annual temperature of 6 degrees, Fahr.; Sydney, 63 degrees; Melbourne, 57 degrees; and Adelaide, 65 degrees.

The mean temperature in the interior is much higher than along the shore; it is said to rise as high as 130 degrees in the shade during summer.

South Australia was perhaps first in the field to introduce a separate forest law.

In Victoria a new Land Act was passed in 1884, which provides, amongst others, for the following matters:

(1) The formation of State forests.

(2) The formation of timber reserves.

(3) The management of both.

(4) The management and disposal of timber and other forest produce on the unalienated Crown lands not included in the State forests and timber reserves.

Under this Act the State forests can only be alienated with the consent of the Governor-in-Council. The timber reserves shall not be alienated in the first instance, but as the several parts become denuded of timber, they may be added to the pastoral or agricultural lands—in other words, thrown open to selection. The timber reserves are, therefore, only temporary reserves.

The forests generally are worked under the license system, regulated by rules made under the Act. There are licenses for felling, splitting, clearing undergrowth, the erection of saw-mills, grazing, removal of wattle bark, etc. For each of these licenses certain fees are paid. Penalties are provided for breaches of the law, or any regulations issued under it.

The question is whether, and in how far, effect has been given to the policy which is indicated in the Act. Mr. Vincent, an expert and a trained forest officer of known ability, who served in the Indian Forest Departments since 1873, gives the following description of forest management in a report to the Governor of the colony, as existing in 1887.

The area of State forests and timber reserves then stood as follows:—

State forests	664,710 acres,
Timber reserves	690,732 "
Total	1,355,442 acres.

Equal to 2,118 square miles, or about 2 per cent. of the area of the colony.

Mr. Vincent visited a number of the State forests, timber reserves, and other forest lands, and he draws a rather gloomy picture of their condition.

This is what he says, for instance, about the Wombat and Bullarook forest (area, 105,000 acres):—"This is said to have been originally a magnificent forest, chiefly of messmate or stringy bark, the timber being of the very best class—enormous quantities have been sent away to Melbourne, Sandhurst, and Ballarat—there were thirty-six saw-mills at work in 1884—the splitters have cut more timber than even the saw-millers—the good timber is now almost all worked out, except in certain localities in the southern half of the forest. In the portion which I visited there are only second-class trees, with a certain number of bigger ones, which have been left for some fault. There has been little or no reproduction, the whole of the young trees have been burnt, and there are no middle-aged ones coming on to yield timber some twenty or forty years hence.

"The useless waste and destruction that have been going on in this forest for the past thirty years defy all description. The saw-mill fellers and the splitters have been allowed to go in and cut when and what they chose. Generally the fellers took one log out of each tree, leaving the rest, which, although not quite so good as the butt-end log, still consisted of first-class timber. The splitters, as often as not, left trees to rot where they had fallen, without even taking out one log, on finding that the wood did not split well. Even if they did split, at

least three-fifths of the timber in the trees was wasted. Subsequently, when the wood thus left on the ground was fired, a fierce blaze occurred, which killed or rendered useless almost as many trees as had been felled. The selection of the State forests has not been well made here, for some of the best forests have been left outside, and inferior growth taken up for the reserve.

"As a large increase in the consumption may be safely anticipated, taking into account the natural increase in the population, the present rapid extension of quartz mining, and the decrease of timber on private lands, there is likely to be a great scarcity of timber in the next ten or fifteen years. Already the mining community complain of the great increase in the price of firewood and timber, and the neglect which the large area of Crown lands in the vicinity of the mines receive. On some mines firewood costs now 30 to 40 per cent. more than it did five years ago, and there is a universal complaint that the timber now supplied for props, laths, etc., is very inferior and immature."

Mr. Vincent then sums up as follows:—"The immediate causes of this are the bad license system, the ill-arranged classification of State forests, timber reserves and Crown lands, the absence of professional foresters to direct operations, and the neglect to reserve the best natural forests. The officials in charge of the forests have often protested against the present license system, explaining that the forests were being rapidly ruined. They explain that they cannot protect the forests from theft, and yet no change is made. Why? Because Parliamentary influence is brought to bear by the saw-mill owners and by the splitters, who are determined that no change shall be made in the present arrangements. Both these classes are powerful, the splitters especially. When an attempt is made by the foresters or the Secretary of Agriculture to do justice to the forests and to protect them, the persons affected organize deputations, questions are asked in Parliament, and concession after concession is made. There is little hope of the forests ever receiving proper treatment until the forest question is made a national one, and removed from the arena of party politics. The question is, are the electors prepared to allow the saw-millers and splitters to devastate the remaining forests, robbing them and their children of their supply of timber and firewood, and risking some of the climatic changes which are traceable to the destruction of forests? Are they prepared to sacrifice a source of large and increasing revenue to the demands of a limited class?"

It was suggested that the Victorian Government should secure the services of a fully competent forest expert, a man like those who introduced systematic forestry into India, who should be directed to go round the colony, see for himself, and then propose what, in his opinion, ought to be done. After all the passing of fine laws is not such a difficult thing. What is of much greater importance is the determination to carry the law into effect when once passed.

Under any circumstances the Government of Victoria should not fall a victim to the delusion that the formation of some limited plantations will make up for the loss of the natural forests. The all-important step to be taken is to gazette and demarcate on the ground a sufficient area of reserved State forests, and to provide for their systematic management, according to the approved rules of scientific forestry, and, in addition, to take what measures are desirable and practicable for the protection of the forest growth on the Crown lands, which are not included in the reserve State forests.

The following short abstract indicates what seemed to be required:—

(1) Engagement of a thoroughly competent forest expert to be the head of the Victorian Forest Department.

(2) Selection, demarcation, and legal formation of a sufficient area of reserved State forests, suitably distributed over the country, systematically managed and efficiently protected.

(3) Protection and disposal of forest produce on Crown lands not included in the reserved State forests.

If the Government makes up its mind to do this, all the details will settle themselves easily enough.

India.

India has to provide an enormous population of 255,000,000 people with timber and firewood, and, apart from a certain amount of teak and fancy woods, that country can probably do little towards an increased export of timber.

There are certain reasons why State interference is more called for in the case of forestry than in most other branches of industry. Most of our valuable timber trees require long periods of time to ripen. Large-sized oak trees are from one hundred to two hundred, and even more, years old. The teak, which comes to England from India, is derived from trees which are on an average at least 150 years old. If forests are to yield a regular annual return of timber they require to have trees of all ages, and consequently a considerable accumulation of material, which has been produced in the course of a long period of time. To maintain the forests in that condition only a quantity equal to that which grows annually should be removed, and no more. If more is removed a reduction of the producing capital must ensue. As long as the estates are in the hands of private parties, they are at all times liable to be overworked, that is to say, more than the annual increment is taken out; and it is easy to see that in a comparatively short time the forests must cease to yield timber. Experience has proved over and over again that this is generally the result. If we are to make over to our children the forests in an unimpaired condition they must be treated in a systematic manner, and this can, as a rule, only be achieved for any length of time by State interference. But the mere theory of such is by no means sufficient. Nominal interference on the part of the State is the most disastrous of all. In that case the forests are looked at as common property, and everybody tries to get the most out of them and into his own pocket, the result being that they disappear faster than ever,

If the State, as such, has arrived at the conclusion that the maintenance under forest of a certain proportion of the area is essential or desirable, it must also, once for all, decide to do what is necessary to secure that area, and to see that it is managed in a systematic and orderly manner. There are various ways of doing this. Either the State establishes State forests by setting aside certain areas at its disposal for forest purposes, or it passes laws which empower it to supervise the management of communal and even private forests. The former alternative is much the best wherever it can be adopted, and this is the case in India and in most of the Colonies.

Practically, only India has really and honestly dealt with the forest question. Some of the Colonies are fairly in earnest, but too many have restricted their action to nominal measures.

India is situated between the 8th and 35th degrees of northern latitude, hence the southern half of it lies within the tropic. Its length, as well as its

greatest breadth, is about 1,900 miles, leaving out of consideration the newly-acquired territory of Upper Burma. The area and population stand as follows :—

	Area in square miles.	Population. Total.	Per square mile.
British Territory without Upper Burma	912,000	202,000,000	221
Native States	531.000	53,000,000	96
Total	1,463,000	255,000,000	170

The physical configuration is very peculiar. The country consists of three great sections :—

(1) The Himalayas.

(2) The Indo-Gangetic Plain.

(3) The Peninsula.

The Himalayan ranges stand out like a high wall on the north, separating India from the Thibetan high plateau. The great Indo-Gangetic plain runs along the southern edge of the Himalayas from Sind in the west to the Bay of Bengal in the east. To the south of this plain, and partly surrounded by it, lies the Indian peninsula, forming another plateau of moderate elevation. The contrasts of elevation which occur in these territories are greater than those in any other part of the globe. While the Himalayas reach a height of 29,000 feet, the plain of Hindustan, at the foot of the hills, rises only a few hundred feet above sea level; further south elevation increases again, since the peninsula shows a height ranging between two thousand and eight thousand feet.

Another peculiar fact is that India receives the drainage of both slopes of the Himalayas, which ultimately collects into the three great rivers, the Indus, Bramaputra, and Ganges. The first two rise in close proximity to each other at the back of the Himalayas; one runs towards the west and the other towards the east, until both break through the Himalayas—the former running through the Punjab and Sind to the Arabian Sea, and the latter through Assam and Lower Bengal to the Bay of Bengal. The Ganges drains the greater part of the south face of the Himalayas, finding its way, after uniting with the Bramaputra, into the Bay of Bengal. The highest part of the peninsula is situated along its western edge, in consequence of which the greater part of the drainage from this part of the country goes in an eastern direction into the Bay of Bengal.

It will be easily understood that in a country like India many different climates are found. As a matter of fact, they range from the driest in Sind to the wettest along the west coast of the peninsula, in Assam, Eastern Bengal, and Burma; and again from the hottest to an arctic climate in the highest regions of the Himalayas. Of these various climates the following four types may here be mentioned as most characteristic :—

(1) The climate of tropical India: Showing the highest average temperature; the early arrival of the monsoon rains mitigates the summer temperature; there is little or no cool season.

(2) The climate of North-western India: Showing the highest summer temperature, though the average temperature of the year is lower than in the

former region; there are four or five cool and even cold months during winter, when the climate resembles that of South Italy.

(3) The climate of North-eastern India: Here humidity reigns supreme; the extremes of temperature in summer and winter are moderated by the effects of the relatively large quantities of moisture in the air.

(4) The climate of the Himalayas: It is, according to elevation, more or less temperate, and even arctic, with frost, snow, and bitter winds in winter, and a moderate heat in summer.

The rainfall depends in the first place on a very simple set of phenomena. The extensive plains and table lands of India are in spring and summer heated to a much higher degree than the surrounding sea, while during winter the air overlying the sea is warmer than that over the dry land—in other words, sea breezes prevail during summer and land breezes during winter.

In spring, which shall here comprise the months of March, April, and May, the highest temperature is found over the centre of the peninsula (Nagpur-Hyderabad), the difference being from five to ten degrees compared with the temperature at the sea coast on the east or west, or at the foot of the Himalayas. The air in the centre expands, lifts the higher layers, causes them to flow away on all sides, and produces a centre of comparatively low pressure. Into this centre presses the heavier atmosphere from the surrounding country, principally from the sea on the south, east, and west, and from the dry table land of Beluchistan and Afghanistan on the west and north-west. As a general rule, the moist sea breezes gain the upper hand and bring a rainfall, ranging from three to six inches during this period. The north-western breezes, on the other hand, are dry, and known as the hot winds of the Bombay Presidency, the north-western provinces, and Centre India. With the advance of the season the sea-winds become stronger and stronger, and the air is then drawn from the most distant equatorial region, the great reservoir of moist air; they now cause a copious rainfall, known as the south-west monsoon. The amount of rain differs, however, very considerably according to the configuration of the country; in other words, according to the degree to which the clouds in their forward passage are forced to rise or sink again, owing to a rise or fall of the surface.

As long as the sea-winds are sufficiently strong to keep in check and even force back the north-western winds, all is well for India; but occasionally the reverse occurs, that is to say, the north-west winds force back the sea-winds and proceed far into the Indian plain and the peninsula. If this ascendancy continues for some time, the rains fail, and scarcity, or even famine, is the result.

In September the monsoon commences to decline, and by degrees north-easterly winds replace the south-western and southern breezes. They are dry, except in part of Madras, where they bring heavy rains until December, and are known as north-east monsoon winds. Local rains of moderate extent are caused during winter, more especially in the Punjab and North-western Himalayas.

The total annual rainfall ranges from 4 inches in some parts of Sind to more than 500 inches in the Khasia Hills, and all intermediate grades are duly represented.

A country which shows such extremes of climate must necessarily show a most varied vegetation. The actual distribution of the forests is principally governed by the rainfall. Where that is favorable, production is great, and the forests are dense; where it is unfavorable, production proceeds at a slow rate. Again, the nature of the rainfall governs the character of the forests. Where the rains are heavy, the country is generally covered with evergreen forests;

where it is less copious, the forests are deciduous ; under a still smaller rainfall they become sparse, and more dry, untill they gradually end in desert. Consequently, the evergreen forests are found along the moist west coast of the peninsula, in the coast districts of Burma, Chittagong, and along the foot and lower slopes of the eastern Himalayas. The deciduous forests occupy the greater part of the peninsula and Burma away from the coast. Dry forests are found in Rajputana, and the Punjab, while deserts are the principal feature of Sind.* With rising elevation in the hills, the forests become gradually temperate, and then Alpine, until they disappear altogether on approaching the lower limit of the eternal snow.

These details on the great variety of climates prevailing in India are given, because some idea on the subject is necessary so as to understand the forest policy, which is indicated in the case of that country. The main issues of that policy depend on the following three points :—

(1) Forests in relation to climate and rainfall.

(2) The regulation of moisture, and

(3) Forest produce required by the country.

The south-west monsoon must for ever be the main source of moisture in India, and the climate and rainfall of the Indian plain, and of the peninsula, are generally subject to other influences, in comparison with which the effects of forests must always remain small. On this account then, afforestation cannot be pushed in the case of India. It must, however, be mentioned that the shade and shelter of forests will be most gratefully accepted by man and beast in a hot country like India.

In a tropical climate like that of India, the evaporation from an area exposed to the full effects of the sun, is probably not less than four times that from an area which is covered by a dense growth of forest vegetation ; hence afforestation is of great importance wherever the rainfall is limited, or unfavorably distributed over the several seasons of the year.

Then, there is irrigation to be considered, No less than 30,000,000 acres of land are artificially watered in India by means of canals, wells, lakes, and tanks. Only three million acres depend directly on the melted snow of the Himalayas, and it will easily be understood of what importance it is to keep the areas which provide the remainder of the water properly sheltered. The larger the proportion of the catchment areas, whence the irrigation water comes, is shaded by forest vegetation, the more favorable and sustained will be the supply of water. On this account, then, forestry in India has an important mission to fulfil.

The mechanical action of forests in regulating the flow of water from hillsides also is not without importance in India, and cases are by no means rare, which show the mischievous effect of reckless deforestation. In this respect, none is more instructive than the case of the hills behind Hushiarpur in the Punjab. These, consisting of a friable rock, were safe until, some forty years ago cattle graziers settled in them and destroyed the forest and other vegetation. Since then a process of erosion has set it, which is carrying by degrees the hills into the plains, where they appear as huge sand-drifts which have already covered enormous areas of fertile cultivated land, and even destroyed part of the town of Hushiarpur. Such an evil can be avoided by preserving the natural vegetation on the land, but, if once started, special measures are required to meet it. In the

*Sind has some very valuable forests, which are situated on the banks of the Indus on land more or less regularly inundated.

first place, grazing must be stopped, at any rate that of goats and sheep, so as to allow a natural growth of plants, shrubs, and trees to come up; artificial sowing and planting must be done, preceded in bad cases by the construction of dams and dykes to steady the soil, until vegetation has once more laid hold of it. Mischief of this kind can be stopped and cured at a comparatively small sacrifice, provided it is taken in hand at an early stage; but if it has been allowed to grow for a series of years, the expenses of checking the evil may be beyond the means of the State.

Although forests are of considerable importance in India in respect of their action as regards the regulation of moisture, they are absolutely indispensable on account of the produce which they yield, since by far the greater part of India must rely on the timber and fuel produced in the country, apart from other produce. All the teeming millions of India use wood for their domestic firing, or, if such is not available, dried cow-dung, the latter being much to be deprecated from an agricultural point of view. At the same time, enormous quantities of timber are required for construction, boat-building, tools, agricultural implements, railways and other public works. If we add thereto a demand for many important items of minor produce, more especially cattle fodder in the drier parts of the country, it will easily be understood that at least 20 per cent. of the total area requires to be kept under forest. Even such an area would give only about half an acre per head of population, an allowance below that of most European continental countries.

The history of forestry in India is very instructive. According to the available evidence the country was in former times covered with dense forests. Then settlers opened out the country along the fertile valleys, but the destruction of the forest on a larger scale was carried out by nomadic tribes, who fired alike hills and plains as they moved from one pasture to another. This process is believed to have gone on for more than 700 years Subsequently came British rule, and with it a more fierce destruction of the forests than before. Extension of cultivation became the order of the day, and before its march many of the remaining woods fell under the axe, no inquiry being made as to the ultimate result. Simultaneously with the extension of cultivation and the increase of population, the annual requirements of timber and fuel increased, while quickly multiplying herds of cattle roam far and wide over the remaining forests. Finally, railways came, and with their extension the forest disappeared with greater rapidity than ever, partly on account of the increased demand for timber used in construction and firewood, and partly on account of the fresh impetus given to cultivation on both sides of the line. I have watched this last process, and I can testify from personal experience how fatal railway extension is to forests which are not subject to proper control and protection.

For some time matters went smoothly enough in India, but then the shoe commenced to pinch. Difficulty was experienced in meeting the demands of timber for public works, sleepers had to be imported from foreign countries, and it was then recognized that a great mistake had been made in allowing the forests to be recklessly destroyed. Experience had definitely proved that the preservation and suitable management of a sufficient area as forests could not be left to private enterprise, and that the interference of the State had become a necessity in the general interest of the country.

The forest question commenced to attract attention in the early part of this century, in consequence of which a timber agency was established on the west coast of the Peninsula.

Next we find, in the year 1843, Mr. Conolly, collector of Malabar, planting teak on a large scale at Milambur, Dr. Gibson was appointed conservator of forests in Bombay in 1847.

In 1848, Captain Frederick Conyers Cotton caused the appointment of Lieutenant James Michael (now Major-General J. Michael, C.S.I.) as Forest Officer in the Anamalais, which post he retained for seven years. Dr. H. Cleghorn became connected with forest conservancy in Mysore in 1847, and he was appointed Conservator of Forests in Madras in 1856. He was on special duty with the Government of India about the years 1860-62 when he inquired into the forest matters in the north-western Himalayas and elsewhere. In the Central Provinces Colonel Pearson was the first Conservator who took up forestry in a business-like manner.

These gentlemen and others were the pioneers of forest conservancy in India. Their action, though localized, caused the matter to be discussed and kept before the public, and it led ultimately to the organiztion of a general department by Dr. D. Brandis (now Sir Dietrich Brandis, K.C.I.E.) The latter was appointed superintendent of Forests in Pegu in 1856 by that great administrator, Lord Dalhousie. Dr. Brandis was principally instrumental in saving the Burma teak forests from destruction by enterprising timber merchants—that is to say—estates which yield now a gross revenue of some £250,000 a year. In 1862, he was attached to the Government of India, and in 1864 appointed the first Inspector-General of Forests to that Government. He then set to work to establish the Indian Forest Department, and to introduce a systematic management of the forests. At first he devoted himself to the Provinces directly under the government of India; subsequently he was twice deputed to Bombay, and he totally re-organized the forest department in Madras in 1881-83, immediately before his final retirement from India.

The first duty of the new department was to ascertain the extent and character of the remaining forests and especially of that portion which still belonged to the Government. This inquiry was not of special difficulty, except in so far as a sufficiently trained staff was not available at the outset.

The next step was to take the State forests under protection and management, and now difficulties arose. There were no doubt some administrative officers who soon perceived that it was to the true interest of the people to preserve a suitable forest area, and who cordially assisted the new department, but the majority of the officers of the State failed for a long time to accept that view, principally because the idea of forest preservation was new to them, and they feared complications from the facts that the rights of government in the forests were in many cases ill-defined, and that the people claimed extensive rights by prescription, and on other grounds, in the areas which were the property of the State.

The first Indian forest law was passed in 1865; it provided that the Government might declare any land belonging to it a Government State forest, and that such declaration should not abridge any right held by private persons over such areas; but the Act did not provide power to inquire into and legally settle the rights of third persons in the State forests. Under this Act considerable progress was made in the preservation of the forests, wherever the population was limited and the forest areas extensive.

But where the reverse conditions prevailed, and where the rights claimed by the people, rightly or wrongly, were extensive, the benefits of the Act soon threatened to become abortive. Consequently fresh legislation was soon contemplated, and after years of discussion, a new Act was passed known as the Indian

Forest Act of 1878, followed by special Acts for Burma, Madras, and one or two other Provinces. Of these, the Burma Act is the best. Generally speaking, the enactments give power to the Government :—

(1) To declare any area belonging to the State, or over which the State has rights, to be a State forest.

(2) To demarcate such area, and to enquire into and settle, once for all, the rights claimed by third persons in or over such area ; to commute such rights if they seriously interfere with the maintenance of such forests ; and to prevent the springing up of new rights except by a Government grant.

(3) To provide for the proper protection and management of the State forests.

(4) To provide for the protection and management of Government forests not included in the reserved State forests.

(5) To provide for the preservation of private forests, which are of special importance to the community as a whole.

(6) To provide for the protection of forest produce in transit.

(7) To provide for the adequate punishment of persons breaking the forest law.

Passing over many other provisions, I shall only add that the Act is throughout permissive, that is to say, the Government may bring its provisions into operation or not, as may be required from time to time.

Under these laws an area of about 55,000,000 acres, which is just under 10 per cent. of the British territory, has been brought under the control of the Indian Forest Department ; thirty-three million acres are so-called reserved State forests, that is to say, areas which have been set aside and are managed as permanent forest estates ; while the remaining twenty-two million acres are as yet so-called protected or unclassed State forests, enjoying a limited extent of protection until it has been finally decided whether they are to be incorporated with the permanent State forests or not. Some fifteen million acres of additional forest lands are at the disposal of Government, which have not as yet been brought under the control of the Department.

It will be noticed that the area of State forests falls considerably short of 20 per cent. of the total area, the proportion which is believed to be that required to meet the demands of the country. There are however, as yet extensive forest lands in the hands of private persons, and although their extent and yield capacity is decreasing every year, a considerable portion is so situated, or of such a description, that it is not fit for permanent cultivation, and may be expected to yield always a certain amount of produce. Interference with these private forests will only be possible in cases of absolute necessity.

The bulk of the required produce must come from the State forests, and if they are to yield that, they must be managed in a careful and systematic manner.

Hence Sir Dietrich Brandis recognized at an early stage the paramount importance of providing a competent staff of officers. He obtained, as early as 1866, the sanction of Government to a scheme, under which every year a number of young Englishmen are selected, and trained in forest science and practice before they proceed to India to take their places as officers of the Forest Depart-

ment. For many years these young men studied forestry in Germany and in France. Gradually the difficulties of studying in a foreign country and in a foreign language made themselves more and more felt, until it was decided to start, in 1885, an English forest school in connection with the Royal Indian Engineering College at Cooper's Hill. Under these arrangements, some 110 officers have been trained and drafted into the Indian Forest Department. At the present moment we have twenty-two forest students under instruction at Cooper's Hill.

These young men are destined to recruit the superior or controlling staff of the department. In addition, it was found necessary to let the future executive officers pass through a suitable course of training, Accordingly, an Indian forest school was started, in 1878, at Debra Doon, in the North Western Provinces, which has been gradually developed, so that it now turns out annually some thirty trained forest rangers. These are almost entirely natives of India; they enter the executive branch of the service, but those of special merit are eligible for promotion to the controlling staff.

The organization of the department may be shortly described as follows:—The Inspector-General of forests is the head of the department, and responsible to the Government of India. The department in each Province is presided over by a Conservator of Forests (or two, and even three in the large Provinces) who is responsible to the Local Government. He is assisted by deputy and assistant conservators, each of whom controls the management of the forests in a district or other part of a Province. Subordinate to this controlling staff are the executive officers, divided into various grades, and they in their turn are assisted by the protecting staff, consisting of foresters and guards, numbering many thousands.

In this manner a well-organized department has been built up during the last quarter of a century, which has under its charge an immense government property consisting at present of some 55,000,000 acres of forest lands. Some of the forests were taken in hand before they had been destroyed, but by far the greater part of the area was taken over in a reduced and even ruined condition. Although a quarter of a century is only a short period in the life of a timber tree, the effects of protection and systematic management are everywhere apparent Economic systems of utilization have been introduced, a large proportion of the forests is successfully protected against the formerly annually recurring forest fires; young growth is allowed to spring up under the protection now afforded; sowings and planting are carried out when required; the forests are managed under carefully considered working plans; and all this without interfering with the acknowledged rights of the people, who receive every year enormous quantities of forest produce, either free of charge or at comparatively low rates. In many parts of the country the people have come to recognize the importance to themselves of the proper preservation of a suitable forest area, and this feeling is steadily extending.

What I have said above refers to British territory. Space does not permit my dealing with forestry in native States, beyond mentioning that of late years many native rulers have commenced forest conservancy in their States, with the assistance and advice of officers of the Indian Forest Department on lines similar to those followed in the British territory.

And now the question may well be asked, how about the cost of all this elaborate organization and the works of protection and improvement?

Well, on that hand, too, I can present you with what I consider satisfactory figures. The net surplus of the Indian Forest Department, after meeting all expenses, has been as follows since 1864:—

NET REVENUE OF INDIAN STATE FORESTS.

1864–67,	average	annual	net revenue	£106,615
1867–72,	"	"	"	133,929
1872–77,	"	"	"	219,919
1877–82,	"	"	"	243,792
1882–87,	"	"	"	384,752

The annual net revenue during the period 1882-87 was nearly four times that of the period 1864-67, and although I am not in possession of the detailed figures for the years 1887-88 and 1888-89, I may state that the gross revenue realized in the latter year surpasses that for the period 1882-87 by about £300,000, Calculated for the whole area of the forests the revenue is as yet small, but there is little doubt, if any, that twenty-five years hence the net surplus will be four times the present amount, provided the Government of India perseveres in the forest policy as developed in the past. The growth of tress is of slow progress, and of all branches of the administration of a country the forest departments require to be more thoroughly guided than any other by the watch-word, "continuity of action."

BURMA.

EXTRACTS FROM RULES RELATING TO RESERVED FORESTS.

1. Within a forest reserve no person shall poison water or set traps or snares, and no person shall hunt, shoot or fish without a license. Any person who in a reserved forest, in contravention of this rule, hunts, shoots, fishes, poisons waters, or sets traps or snares is punishable under section 25 of the Act with fine, which may extend to Rs. 50, or when the damage resulting from his offence amounts to more than Rs. 25, to double the amount of such damage.

2. Such license may be granted by the deputy commissioner or forest officer in whose local jurisdiction such reserve is situated. Provided that no such license may allow hunting or shooting during the season when forest fires most commonly occur, namely: from the 1st March to the 1st June, nor the hunting or shooting of pheasants, jungle-fowl, partridges, quails or hares, during the breeding season, namely: from the 1st March to the 1st September.

3. Such license to be in form provided, and a fee of Rs. 10 may be charged for the issue thereof,

4. Between the 5th day of January and the 15th day of June no person shall, within two miles of the boundary of a reserve, leave any fire burning unless he shall have taken the following precautions, namely:—

(*a*) He shall, at least one week before kindling such fire, have given notice of his intention to do so to the nearest forest officer.

(*b*) He shall have cleared of inflammable matter a belt of ground of not less than twenty feet in breadth around the place whereon he proposes to kindle such fire.

(*c*) He shall have kindled such fire at a time when no high wind is blowing in the direction of the reserve.

Any person who, in contravention to this rule, leaves any fire burning in such manner as to endanger a reserved forest, is punishable under section 26 of the Act with imprisonment for a term which may extend to six months, or with a fine which may extend to Rs. 500, or with both, in addition to such compensation for damage done to the forest as the convicting court may direct to be paid.

NOTES ON FOREST MANAGEMENT IN GERMANY.*

The following extracts are made from a work published by Sir Dietrich Brandis to facilitate the instruction of senior Forest students at the Cooper's Hill Royal Indian Engineering College, England, and deal with the subject of Forest Management in Western Germany. Though intended primarily for Indian Forest Officers, they are not without a bearing on the subject of Forestry in Ontario :—

The character of modern forestry may be said to consist in this, that each portion of the forest is treated with special regard to the peculiar conditions of the locality and the requirements of the growing stock, while due attention is constantly paid to the systematic arrangements of the entire forest range. The working plans prepared at the present time are elastic, and they are carefully framed to adapt themselves to the circumstances of the case.

Baden Forest Administration ; Blocks of the Wolfsboden Range.

Block 1 (compartments 1–72.) Aha, 2,053 hectares, comprises the valley of the Aha stream, as well as the northern slopes of the range which separates the Alb valley from the Schluchsee, and the head waters of the Aha stream, 884 to 1,300 m. Spruce is the prevailing tree, with silver fir at lower elevations and beech near the top of the ridge. *Pinus montana* and Scotch pine in and near peat bogs at the head of the lake, and on the head waters of its feeders.

Block 2 (compartments 1–61.) Alb, 1,679 hectares, occupies the south-western slopes of the range mentioned under Block 1 above and opposite to St. Blassien, and a small area situated between the two branches of the Alb above their juncture, elevation 770 to 1,270 m. Spruce is the dominating tree, with silver fir here and there, occasionally up to one-fourth of the growing stock. Beech more abundant near the top of the ridge. Scotch pine in a few places on steep and dry slope, with a south-westerly aspect (compartments 7 and 8.) Very good natural reproduction on the piece situated between the two branches of the Alb, overlooking the northern branch, in compartments 40 and 44. Young poles of excellent growth, mainly spruce, with a little beech and silver fir, 430 cub. m. per hect., at 950 m. mean elevation in compartment, 28. Fine old forest though not completely stocked, spruce with 25 per cent. silver fir 100 to 150 years old, with 100 cub. m. per hect. in compartments 32 and 33, on opposite sides of the small valley leading to Muchleland. Also near the southeast end of the block, at a similar elevation part of compartments 7 and 8 stocked with spruce mixed with silver fir and beech, 70 to 150 years old, with 650 to 800 cub. m. per hect. A large extent, the greater part of compartments 14, 15, 23, 24 with portions of the adjoining compartment, nearly 100 hect. of mostly pure spruce 60 to 100 years old on the top of the hill called Botzberg, which overhangs St. Blassien, between 1,100 m. and 1,270 m. The forest is completely stocked, the soil is good, with a dense covering of moss, the climate very moist, but the trees are short. The growth is slow, and hence there is not so much timber upon the ground as there might otherwise be, 300–350 cub. m. per hect. The reason is the high elevation and severe climate. At a lower elevation the growing stock of the same age in such a locality would be much larger. According to old traditions the trees were habitually felled while the snow was on the ground, and this agrees with the remains of the stumps 2 m. high overgrown with moss, standing in these and other compartments. On the tops of such stumps the seed of the

*By Sir Dietrich Brandis K.C.I.E., Ph.D., F.R.S., late Inspector-General of Forests to the Government of India.

spruce has often germinated, and the young plant has sent its roots over the decaying stump into the ground. The stump has perished, and the tree stands now, as it were, upon stilts in the air supported by its roots.

Block 3 (compartments 1–4.) Kutterauer Halde, 90 hect., a small detached block, occupying the lower slopes of the Alb Valley, 2½ km. below St. Blasien, at an elevation of 700 to 840 m. under the village of Hochenschwand. Spruce, silver fir and beech, with a little oak.

Block 4 (compartments 1–3.) Schwarzathal, 616 hect., occupying the slopes on the right side of the Schwarza Valley, below the village of Hochenschwand. Spruce, silver fir and beech, with a little oak in the lowest part. More than half of this area has been acquired within the last fifteen years, chiefly by the purchase of private forests and pastures which now are planted up with pine, spruce and larch.

Blocks 5 and 6 (compartments 1–6), 179 hect., are two small detached blocks, Blasiwald and Dresselbach, lately purchased.

The total area as here stated, 4,617 hect. for Wolfsboden, and 3,144 hect. for St. Blasien refers, it must be understood, to 1887, and comprises some pieces included within forest limits since 1885.

Utilization of Forest Produce.

With so large a forest area, the question naturally arises whether there is a sufficient demand for all the timber and wood annually produced. For charcoal there was formerly a very large local demand for the numerous iron and glass works which existed upon these hills. The names of places such as Althutte, Altglashutte, recall the former existence of this industry, which is now nearly extinct. The last considerable iron works belonged to the State, and these were closed in 1863; some glass works existed until 1877. The completion of works elsewhere using mineral coal, and favorably situated near railways and rivers, was too powerful, and the struggle of these small establishments, situated far from rivers and railways in out of the way and difficult mountainous districts, against such powerful opposition was hopeless, though the abundant water power available and the cheap and plentiful supply of charcoal gave them important advantages. Quite lately, I am informed, a prospect has arisen of selling large quantities of small wood for making charcoal which is wanted by large iron works in Switzerland. On the other hand, the construction of roads has greatly facilitated the export of forest produce. The road up the Wehra Valley to Todtmoos was built in 1848-49, and that from St. Blasien down the Alb Valley was completed in 1861, and it is now proposed to construct a road from the Schluchsee along the valley of the Schwarza to the Rhine, which will greatly facilitate the export of timber from the forests in the basin of the Schluchsee and in the Aha Valley. St. Blasien and the the country around has long been connected with the Rhine Valley by an old carriage road, but it ascended the plateau with a rise of nearly 300 metres and then continued with numerous descents and ascents to Walshut. For the export of timber, roads along the valleys with an even and gentle gradient are indispensable. The construction of convenient main roads has been supplemented by a system of well designed cart roads throughout the forest, and thus it has become possible as already mentioned, to sell the thinnings from some of the forest as hop-poles. The construction of these forest roads commenced in 1860 and every year new lines are added in order to complete the system laid down in the programme.

It is a remarkable fact that in this part of the Schwarzwald water carriage has never been used for timber to any large extent. The elaborate and most skilful arrangements which were formerly used, and are still in use to some extent, to facilitate the floating of timber on the Enz, Nagold, Murg, Wolfach and Kinzig rivers in the northern Schwarzwald, were unknown here. At first sight this seems difficult to understand. But the rivers of the southern Schwarzwald, particularly those here in question, the Alb and Wehra, have a much greater fall, and their bed in places is more narrow, and more obstructed by rocks and stones than that of the northern streams, in which floating has been chiefly practised.

The following is a sketch of existing arrangements for the utilization of the produce of these forests. For felling the trees, fashioning the timber, and bringing the logs to the roadside where they are sold, contractors (accordanten) here, as in the other State forests of Baden, are employed by the district forest officers. In each range four or five of these contractors generally find employment throughout the year. They are men of long experience in the business, picked, and to a great extent trained, by the Oberforster himself. Each works, according to circumstances, with from 8 to 15 timber cutters, the contractor being the foreman and working himself with the men, with whom he shares the profits arising from their operations.

As previously explained, by far the most important produce of these forests consists in the timber of spruce and silver fir. The following remarks will be mainly limited to them. The mode of utilizing beech wood offers no peculiar feature.

The thinnings in young forests are generally made between June and August. The poles to be taken out are marked by the forest guard, under the district forest officer's general direction. The forest guard is authorized to permit more experienced timber cutters to mark, under his supervision the poles to be thinned out. It has not having been possible to carry out thinnings in young forests as extensively as would be desirable, for the poles cut are in many cases, unsaleable. The spruce and silver fir forests of those portions of the Black Forest which adjoin the Rhine Valley and of the Vosges on the other side of that river, supply poles for the hop gardens of Alsace and Baden at lower rates. The forests of St. Blasien therefore can, in exceptional cases only, enter into competition with them. The present depressed state of the hop market makes it unlikely that hop-poles will be largely exported fr m these forests.

Mature timber is generally cut between April and the middle of June, and during the remaining months of summer and autumn the logs are prepared and brought to the roadside. As already mentioned, winter felling was customary, to a certain extent at least, in old times, but in those days charcoal was the main article produced, and the timber was at once cut up for the charcoal kilns into billets which were easily moved on sledges over the snow. At present, when large timber is the chief article produced, winter transport is not feasible, and during the last 40 years summer felling has become the general rule in these districts.

The first operation is to bark the trees. Of the spruce bark a considerable portion is sold for tanning, that of the silver fir is used as fuel. Timber of prime quality, whether spruce or silver fir is left in logs as long as possible and for such timber the contractor is paid for at the rate of 2 mark per cub. metre. It is classified under five classes, the first and second comprising those logs which at 18 m. (59 ft.) from the butt end have a diameter of 30 c.m. (12 in.).

and 22 c.m. (9 in) respectively, while logs of the third class are required to have a diameter of 17 c.m. at 16 m. from the butt. The rest, known as Sageklotze and Lattenklotze, is cut into convenient lengths, generally 5 to 6 m. and brought to the local saw mills, where it is converted into planks and battens For this class of timber the contractor is paid 1.60 mk. per cub. metre on delivery at the roadside.

A certain portion of the timber, chiefly of spruce, is in these forests used for splitting. At Bernau, a large village north-west of St. Blasien, and other places in the vicinity there is a thriving industry in sieves, tubs and other articles made of split wood. The workmen brought up to this special branch of the trade make a careful distinction between logs which split readily and those not so suitable for their work, and the former fetch a much higher rate at the sales. Thus, in the Alb Valley forests of St. Blasien, from which the coopers of Bernau draw their chief supplies, the three first classes of logs when fit for splitting, sold in 1885 for 21.2, 18.2, and 15.2 marks per cub. metre respectively, while ordinary logs fetched only 16.8, 14.4 and 12 marks. In 1886 the figures were 19.9, 16.5 and 14.1, for logs fit for splitting and 15.9, 13.8, 10.9 for ordinary timber.

The Oberforster of St. Blasien regularly employs one of the men from Bernau in order to mark the logs fit for splitting, and the logs thus marked are sold separately. I spent a day in the forest with this man in order to learn the characters upon which he relied. The first condition is that the log must be regularly shaped and clean, without knots and branches. Secondly, the fibres must not be much twisted and if twisted at all, the twist must go from right to left. On barked logs the twist is readily seen by the direction of the fine fissures on the surface of the wood. It can also be recognized, but less distinctly, on the bark of standing trees.

In order to drag the timber to the temporary depots at the roadside, where the sales take place, horses or bullocks are employed when the ground is level or nearly so. Down a slope, however, the timber is lowered by means of ropes. The tools used for this purpose are of the simplest description, a stout rope 140 feet long, a strong iron hook, with a ring to which the rope is attached (Seilhaken), and a kind of pick (krempe), the wooden handle 4 to 4½ feet and the iron 18 inches long.

On slopes large trees are always felled with top and branches down hill, and the logs are sent down top end forward, two men holding the rope, which is generally slung round a tree, while four or five men, all armed with picks, work alongside the log, lifting it over uneven places in the ground or other impediments, stopping it while the rope is slung over another tree lower down and generally directing its course. It is a fine sight to witness the speed and precision with which this difficult work is accomplished. Accidents very rarely happen.

In the latter portion of summer and in autumn, the timber intended for export is all carted down to the railway station. It chiefly goes westward, to Switzerland, Alsace, and France. This manifests itself in the higher rates realized at sales in the Wehra than in the Alb Valley division of the St. Blasien State forests range, which have to be carted nearly the same distance before they reach a railway station. In the Wehra forests first class logs in 1885 fetched 17.9 and in the Albthal forests 16.8 mk per cub. metre. In 1886 the figures were were 19.4 and 15.9.

Small branches, as well as the underground wood, are unsaleable. The collection of small branch wood is permitted, and, where practicable, the condition is attached to the permission granted that what remains on the ground must be burnt.

Of the larger branches and of the poles obtained by thinnings, small quantities have as already mentioned, latterly been sold as hop-poles. A new demand for small wood has fortunately arisen through the erection of paper-stuff factories from wood, the first of which was built in 1874. There are four such factories now in the vicinity, and to these it is due that much of the small-sized spruce timber, for this is the only kind used by them at present, can be disposed of.

The yield of minor forest produce in these districts in insignificant. Here, as elsewhere in the Black Forest, the spruce was formerly extensively tapped for resin and in Wolfsboden the collection of resin in a few places, where the old trees formerly tapped are still standing, is still let out, but this will soon cease, as the old trees are being cleared away rapidly.

Regeneration of the Forest.

In some cases, for instance where a large proportion of old trees formerly tapped for resin are on the ground, it is necessary to clear and plant, but, as a rule, the system followed is to rely upon natural reproduction as much as possible, and this necessitates the gradual cutting of the mature stock. It has already been stated that the mean age at which the timber in these forests is cut is 120 years. When the time arrives for commencing cuttings in a compartment which has attained that age, the first operation is to clear away all soft woods and useless brushwood, and to cut out any advance growth that may be on the ground and that may not be suitable to form part of the young forest intended to be produced. After this follow in succession a series of cuttings more or less heavy, the beginning being made with the removal of all oppressed, damaged and diseased trees. These successive cuttings are generally continued in these ranges during a period of from 30 to 40 years. Thus in 1858, when a preliminary cutting had already been made, compartment 31 of Block 2 in Wolfsboden was stocked with a forest of two-thirds spruce, and one-third silver fir, containing 800 cub. metres per hectare, 11,432 cub. feet per acre. In 1864 the first heavy cutting removed 200 cub. metres per hectare (2,860 cub. feet per acre). Afterwards five successive cuttings were made, which only left 80 cub. metres (1,143 cub. feet per acre), in 1887. Meanwhile the ground has got well stocked with young growth, and the remaining old trees will probably be cleared away by 1896. This long period of regeneration is necessary, because seeding years in the cold climate of these districts are scarce, in the case of spruce and silver fir every fourth or fifth year, and in the case of beech once in 8 to 10 years. But there is another object besides, viz. the great increase in timber of the trees left standing in a more isolated position after each successive cutting, hence the practice is to keep the most vigorous trees to the last. In the case of the silver fir, groups of younger trees or single trees are left standing after the series of cuttings has been completed; they form part of a new forest growing up, and will be cut, when the next rotation comes round, having then attained an age of 200 years or more.

FOREST RANGES FORBACH (I AND II) AND HERRENWIES.

The three forest districts to which the present remarks specially relate are the following. Area and actual yield are for 1886:—

	Productive forest area, in hectares.	Annual yield in cubic metres.		
		Sanctioned.	Actual, 1886.	
			Total.	Per hectare.
Forbach, I	3,609	16,720	18,906	5.24
Forbach, II	4,977	32,000	29,257	5.88
Herrenwies	3,459	21,000	18,894	5.46

Of these, Herrenwies, which is entirely State forest, is situated on the head waters of the Raumunzach, and occupies a portion of the range west of the Murg. Forbach I comprises the communal forests of Forbach, Langenbach, Gausbach, and a few other villages, as well as the Heiligenwald (Saints' Forest) of 860 hectares (2,124 acres), which is the property of the Forbach parish church. In these forests the Oberforster has the management in his hands in the same manner as in State forests. In regard, however, to the disposal of the wood cut by him, the communal authorities, and the trustees of the church are at liberty to make their own arrangements. As a matter of fact, they gladly avail themselves of the Oberforster's services in this part of the business also. From the proceeds of these communal forests roads, school-houses, and other public buildings are built, and the income from these forests is sufficient to defray all other expenses of the municipalities, so that the members of these communities not only enjoy immunity from all local rates and taxes, but also pay no school fees for their children. Part of the firewood which forms the yield of these forests is distributed among the villagers, so that they have most of their fuel free. For timber and other wood they pay like other people, but the money yield of most of the communal forests in the range Forbach I is so considerable that a certain surplus is divided annually among the villagers. Thus the people of Gausbach and other villages have this year received a share of the surplus, amounting to 70 mk. (£3 10s.) each householder.

The study of this and other communal forests in the Grand Duchy of Baden, and in many other parts of Germany, will be found most instructive for those who have to deal with forest matters in India, for there is no doubt that the success of the endeavors which of late years have properly been made to stimulate the development of local self-government in the different Provinces of India will, to a great extent, depend upon the success which may attend the efforts to place the self-government of towns and villages upon a stable footing, by organizing a good management of such landed property as these communities possess, or may hereafter be able to acquire.

The income derived from the Heiligenwald has of late years been allowed to accumulate, until the amount had become sufficient for the erection of a new church, which has been completed at a cost of 350,000 mk. (£17,500).

Forbach II consists of the forests belonging to an ancient corporation (Murg Schifferschaft). The State has of late years purchased a large portion, about

one-half, of the shares, and since that time (1886) the management of these forests has been intrusted to a State forest officer.

As already mentioned, the prevailing trees are spruce and silver fir, the latter being more abundant at lower elevations, while the spruce predominates in the upper portion. With them the beech is associated at all elevations, but in varying proportions, for while in some places it forms a large portion of the growing stock, it is almost absent in others. The Scotch pine is found in the granite region, chiefly upon dry, steep, rocky slopes with a southerly aspect, while in the sandstone region it occurs almost everywhere, sometimes scattered, and in other places forming an essential element of the growing stock. A remarkable feature here is the occurrence of mixed forest of Scotch pine and silver fir, the latter forming a kind of high underwood under the former.

Although these forests present great variety of soil and other conditions, yet upon the whole it may be said that in places the growth of the species mentioned is magnificent.

The three conifers attain a height of from 40 to 45 metres, the stems carry their girth well up to a great height, and are, as a rule, regularly shaped. Seed years occur frequently, and the reproduction is generally very good. A marked difference is, however, noticeable, especially at lower elevations, between slopes with a southerly and northerly aspect, the latter showing much better growth and more abundant reproduction The disease most frequently observed consists of the irregular swellings on the stem of the silver fir, commonly known under the name of cancer. Considering the enormous area of unbroken forest, on both sides of the Murg Valley, chiefly composed of conifers, it is remarkable how little damage by insects takes place. Storms and snows do some damage, but upon the whole it is insignificant. At times the pressure of the masses of snow is so heavy that large trees are bent down gradually and uprooted. There are not many species of subordinate importance, and those which occur are scarce upon the whole. Along the valley from Gernsbach to Forbach, and even higher up, the oak forms a fringe at the lower edge of the forest, and a few oak trees are seen scattered over the whole granite region. The hornbeam is found here and there, associated with the beech, and single specimens of the sycamore are now and then met with. On peat soil at high elevations, and on the top of the two chief hill ranges, a considerable area is stocked with the mountain pine, and in such places the birch is also common.

Of shrubs there is no great variety. It may be justly said that the forest is everywhere too dense and too well stocked for much subordinate vegetation. In old and dense forests, where there is not sufficient light for the young growth to come up, the ground is frequently covered with *vaccinium*, brambles are almost absent, and the wild raspberry is scarce.

From time immemorial these forests have been treated on the system of selection fellings (jardinage), and this system is still followed in the two Forbach ranges. Here, therefore, the character of the forest is extremely varied, trees of all ages standing on the ground together. Formerly, the practice was to select the finest and most accessible trees for felling. In this respect a great change for the better has now taken place, for the aim at present is to cut out all unsound and badly-shaped trees first, so as to leave more room for the young growth and the more vigorous trees A rational treatment of forest on the selection system cannot easily be brought under precise rules; the manager must consider the requirements of each plot separately, and this is being done at present in these forests.

In order to determine the annual yield of forests managed under the selection system it is necessary to measure the old timber over the entire area, and the work cannot be shortened by the examination of sample plots. Thus, at the renewal of the working plan for the Schifferschaft forests in 1886, all large trees (in diam. 15 c. m. = 6 inches and upwards) were measured on 85 per cent. of the total area. This was accomplished in two working seasons by two valuation officers, an immense and most difficult piece of work, considering the dense underwood of young growth which in most places covers the ground under the old trees. The volume of the smaller trees was estimated, and the total growing stock was thus determined at 1,912,244 cubic metres, exceeding the normal growing stock by 232,688 cubic metres. The rotation for this forest range was fixed at 120 years, and upon these data the annual yield was fixed at 32,000 cubic metres, or 6.43 cubic metres per hectare. The average growing stock was 382 cubic metres, but in many compartments the volume of timber exceeds 700 cubic metres per hectare.*

In 1886 the sanctioned yield of the Schifferschaff forests was not fully worked up to, whereas, in Forbach I, there was an excess of 2,200 cubic metres over the sanctioned yield, caused partly by the timber cut for road-making, partly by some extraordinary requirements of the village of Forbach.

In the Herrenwies range the plan is, not to continue the system of selection fellings, but gradually to introduce the system of felling by compartments (schlagwirthschaft), and in some portions of this range considerable progress has been made in this respect. Large areas are now stocked with uniform thickets up to twenty years old, while others are stocked with pole forests, so that in places a regular gradation of ages has been brought about. This has been accomplished by the gradual removal of the old trees, under the shelter of which the young growth had come up.

The rotation here, as in the two other forest ranges, has been fixed at 120 years, and it is intended that the period assigned to the cutting out of the old timber and the regeneration of the forest is eventually to occupy thirty to forty years.

Considering the enormous area of the forests, it is remarkable that all the timber in them can be sold. Underground wood, however, finds no purchaser anywhere in these forests, and only in the vicinity of the villages will people undertake to root up the stumps on taking away the wood without payment. The removal of tops and branches is free throughout these forests. The bark, at present at least, is not sold, but is removed free with the branch wood. The produce of thinnings formerly found a ready sale in the hop gardens of the Rhine Valley, but the cultivation of hops has of late years greatly diminished, and much of the small wood would remain unsaleable if numerous factories of paper pulp had not, about fifteen years ago, been established in the Murg Valley. This has opened a new demand not only for poles but also for small trees. At present the paper pulp factories have a decided preference for spruce, and pay more for clean stems without branch knots.

At Schonmunzach, already mentioned as the first village of Wurtemberg territory, is a large glass factory, which works with gas made from wood, and this factory consumes annually a very large quantity of small wood. It is not improbable that hereafter the inferior kinds of wood produced in the fire-protected forests of India, which at present are unsaleable, may be used for the pro-

* It would lead too far in these notes to discuss this question why the Murg Valley ranges here described, possessing as they do unusually favorable conditions for the growth of spruce and silver fir, have a smaller annual yield in material than the St. Blasien and Bonndorf Ranges in the southern Scharzwald.

duction of gas for iron smelting, and that thus it may be possible to revive the old iron industry in some parts of India. Indian forest officers will do well to visit the Schonmunzach glass works.

The disposal of large timber is greatly facilitated by the numerous saw mills in the valley of the Murg and other rivers, and most of the timber from the Murg forest is now exported in the shape of beams and boards. Of the principal kinds of timber sold spruce and silver fir command the same rates, while Scotch pine generally fetches a somewhat higher figure.

Timber is cut during spring and summer. In forests like these with much young growth under the trees, great care is necessary and is used, so as not to injure the mass of seedlings and saplings on the ground. In dragging the timber much attention is paid to this, and as a further safeguard the branches of the standing trees are lopped before felling. This is done by men who climb the trees, with the aid of foot-irons, and who are paid at the rate of from 20 to 30 pfennige a tree. A skilful man can lop ten to fifteen trees, thus earning from 2s. to 4s. 6d. a day. Formerly the custom prevailed to lop the branches of trees standing over young growth intended to remain on the ground so as to diminish the shade. This practice, however, has of late years here been abandoned because it was found that the lopping of branches made the trees unsound. Through the whole forest are narrow dragging paths, some in their natural condition, others levelled and built up. The timber is brought to the edge of these dragging paths, and there the sale takes place. The logs are dragged generally by horses, with or without the help of a pair of wheels, according to the gradient of the path.

A system of carting roads, however, is being steadily extended over the whole forest, and the timber carts carry very heavy loads measuring up to ten or twelve cubic metres. Under the present practice the stems are brought out as long as possible, provided they are sound, for it is found that the proprietors of the saw mills pay higher rates when they can cut up the logs according to their particular requirements. For timber work on the dragging paths, as already mentioned, as well as for carting, horses are generally employed, and from spring to autumn the roads are full of large timber carts, on which huge logs, up to 30 m. in length, are carried down the valley.

Coppice Under Standards Near Kippenheim, in the Rhine Valley.

The contrast between the unbroken forest of the Schwarzwald, interrupted only here and there by stretches of field, not very productive, and the rich plains of the Rhine valley bearing splendid crops, with luxuriant meadows on low ground and extensive vineyards on the hills, is exceedingly striking. In the Rhine valley, between Freiburg and Offenburg, one of the most fertile portions of Baden, there is not much forest, but what there is produces large quantities of most valuable material. Here are situated the forest districts of Kippenheim and Ettenheim, which comprise the State and communal forests situated in the civil district of Ettenheim. Kippenheim, where the Oberforster resides, is a large village, situated at the foot of the hills, which rise into the Schwarzwald. Like some of the other villages in this district, it has forests both in the outer hills and in the Rhine valley. The produce of these communal forests is sufficient in the case of this and other villages in the vicinity to cover all municipal expenses, so that the inhabitants have to pay no local taxes and no school fees. The forests in the plains are of special interest, and particularly those which belong to the Kippenheim forest district. They form a compact block six kilometers long and

one to two kilometers wide, and are situated between the Rhine and the foot of the hills at an elevation of 170 metres. One hundred and forty-nine hectares of this area belongs to Government, and is known under the name of Kaiserwald; the rest belongs to six villages in the vicinity. Of these the best stocked and most instructive is that belonging to the village of Grafenhausen, 148 hectares, adjoining the Kaiserwald on the west side. Over the whole area of these forests the soil is not uniformly good. It always consists of a surface layer of loam with much vegetable mould, resting upon a stratum of more binding clayey soil under which there is a thick stratum of gravel. The thickness of the soil overlying the gravel varies. At the same time there are slight differences in level, and these circumstances are believed to have a considerable influence on the distribution of the trees of which the forest is composed.

The whole of this forest is treated as coppice under standards. In low situations and on moister soils, where soft woods prevail, the rotation of the coppice is 25 years, but most of the area is worked under a rotation of 30 years. The species of which these forests consist are ash, oak (*Quercus pedunculata*), alder, hornbeam, sycamore, and elm. Of subordinate importance are birch, aspen, maple, wild cherry, and willow. Over the greater part of the forest the ash prevails, and its proportion is being steadily increased by planting. In suitable localities this is also the case with the oak. In regard to the influence of the soil upon the distribution of the different kinds, it may be said that where the gravel is dry and near the surface the hornbeam prevails in the underwood and the oak succeeds particularly well, while in such localities the ash is apt to become stag-headed after the age of sixty years. Such places also generally have a somewhat higher level. Where the gravel is moist the ash, the hazel, and the elm prevail; where the gravel is wet the oak is wanting, while the alder, elm, and hazel abound. In such places, and on low ground generally, the rotation is only twenty-five years, because this is sufficient for the prevailing kinds, which, as already stated, are the alder, the elm, and the hazel. In such places, however, the proportion of the ash is being steadily increased by planting, and eventually the normal length of a thirty years' rotation will probably be established.

Coppice and Field Crops in the Siegen District.

The Sieg, which flows into the Rhine below Bonn, drains a large area of mountainous country, rising to near 700 m. (2,300 feet), the rocks of which, clay slate and grauwacke of the Devonian formation, are remarkable on account of the numerous veins of excellent iron ore which they contain. The oak is the principal tree, forming excellent high forest, more or less mixed with hornbeam and beech, up to the top of the highest hills, such as are rarely found in similar localities, while over an area of 57,000 hectares (140,800 acres), on both sides of the Sieg as well as on the headwaters of the Dill, a tributary of the Lahn River, a peculiar class of oak coppice prevails, known under the local designation of "hauberge." This area is situated in the circles (Kreise) of Siegen and Olpe, which form part of the civil district (Regierungsbezirk) of Arnsberg, belonging to the Province of Westphalia, and in some tracts belonging to the adjoining district of Coblenz and Wiesbaden. The following remarks relate chiefly to the circle of Siegen.

In the narrow valleys of this mountainous country are numerous factories, mines, and iron works, some of them of old standing, formerly worked with water-power, now mostly with water-power and steam, surrounded by well-watered meadows, with very limited areas of fields and gardens. The hills are well wooded, and, as already stated, almost exclusively stocked with oak. In the

midst of the oak coppice, on the slopes and ridges, are numerous extensive fields with rye, the pale green of which in early summer contrasts strangely with the dark green color of the oak forest. These fields change their position from year to year, so that the traveller who visits these hills in two successive years finds the aspect of the landscape changed, though its general character remains the same. The high forest which covers the tops and ridges belongs to the State or to large private proprietors, but the vast areas of coppice which occupy the main portion of this tract of country do not belong to the State or to private proprietors, nor to town or village communities but to public corporations, commonly regarded as the remains of the old "Markgenossenschaften," which in the words of the late Sir Henry Maine, were "an organized, self-acting group of Teutonic families, exercising a common proprietorship over a definite tract of land, its mark, cultivating its domain on a common system and sustaining itself by the produce." The coppice is managed on rotation of from 17 to 20 years (19 years on an average), and the area assigned to each year's cutting is treated in this manner. Early in spring (March, April) all soft woods, birch, hazel, aspen, and others, as well as the most slender shoots of the oak coppice, are cut out, the operation proceeding from the bottom of the valley upwards. At the same time the poles intended to be peeled are cleaned by cutting off the lower branches. As soon as the season is sufficiently advanced for the bark to come off readily, generally in May or June, the poles are peeled standing, the operation being performed as follows:—From a cut made breast high the the lower portion of the bark is taken off downwards, while the upper portion is peeled upwards, the upper end remaining attached to the pole. In the case of high poles ladders are used, and weak poles are bent down in order to peel them. The naked poles remain standing until the bark is dry. Long strips remain hanging; smaller pieces are tied up in bundles and are hung upon the poles. In the case of poles which have sprung from seed, either natural or planted, the rule is strictly observed to ring them close to the ground by a circular cut going through the bark only. The bark then comes off down to the girdle only, and this promotes the growth of coppice shoots from the stool.

The wood is cut as near the ground as possible, the cut being smooth and slanting without splitting and without injuring the roots. The poles over 5 cm. (two inches) diam. are cut one to two inches above the ground by means of two opposite cuts slanting upwards. Seedlings, whether natural or planted, not yet fit for peeling, remain standing so they may not be damaged by hoeing and when the corn is cut.

The wood is placed on the ground between the stools with the butt end down hill, and is removed as soon as possible without injuring the young shoots from the stools.

Immediately after the bark has been peeled and while the naked poles are still standing, the ground between the stools is worked up with a hoe of peculiar shape, the sharp edge indented, and is turned up in sods, which are gathered in heaps and when dry are burnt, with the aid of the small branch wood.

The burning takes place between July and September. The ashes are then evenly spread over the ground with a shovel, and the rye is sown broadcast.

The seed is worked into the ground with the aid of a peculiar kind of light plough without wheels, locally called "hainharch," drawn by cows or oxen, which are muzzled so as to prevent their browsing upon the young shoots of the oak coppice. The crop is always clean, without weeds. In August the harvest takes place, and the corn is cut with the sickle, so as not injure the young coppice shoots of the oak.

System of Management: Its Origin.

The management of the forest estates here described is entrusted to committees, elected by the shareholders for a period of six years. Each committee consists of a chairman and one or two members. The current duties are conducted by the chairman alone, but certain matters, such as the appointment of the guard who is intrusted with the protection of the estate, are by law and custon assigned to the full committee.

In order to maintain the coppice well stocked, cultural operations are regularly carried on in most of these estates. The old established practice is to dibble in acorns in lines about 2 m. apart. either with the seed corn in autumn, or in spring with the young crop, or in the second autumn into the stubble. Where sowings have been made the broom is cleared away when it threatens to choke the young plants. Cattle are excluded until the plants are sufficiently advanced to be beyond damage. Where it is not possible to keep the area closed so long, strong saplings 1½ to 2 m. high are are planted about 3 m. apart, and in order to provide a sufficiency of such plants suitable nurseries are established for each estate. The chief civil officer of the circle (Landrath), together with six shareholders who are elected for a period of six years by the whole body of hauberg associates, form a board of control for the management of these estates throughout the circle (Schoffenrath). This board appoints one or several forest officers, who have the supervision of the management of these estates as far as regards professional matters. The board also assigns the area to be subject to their inspection, and is empowered by law to decide all matters relating to these estates that may be referred to them. At present there is one forest officer (Hauberg Sachverstandiger) for the entire circle. His chief duty is to watch over the due observance of the treatment laid down by law, and generally by his advice and personal influence to promote the good management of these estates. All these matters are governed by a special law based upon old ordinances and customs existing in regard to these estates. The law which is in force at the present time was passed by both houses of the Prussian Parliament in 1879.

The system under which these forests are managed is very old. The oldest document preserved regarding it is of 1447, and a detailed account exists of 1553, from which it appears that in its main features the system then was the same as at present. The peculiar development of the system must be attributed to two circumstances, the requirements of the mining and iron-making industry, and the insufficiency of arable land in the district.

Formerly, all the iron works in this district were worked with charcoal, which the forests furnished, and for this purpose coppice was the simplest and most convenient mode of treatment. The poles, whether oak, birch, or other kinds, could readily be utilized for charcoal. The mines and the iron-works in this part of the country in former times were always owned by associations (genossenschaften) and in some cases these associations may have also owned the forest lands adjoining the works. In any case, the organization of the "Hauberg genossenschaften" has developed in a manner similar to that of the mining associations. At the same time, the population, though never dense, as compared with the plain country, nevertheless did not produce corn enough for their maintenance, nor was there sufficient litter for their cattle. In this manner the necessity arose to utilize the forest for the temporary cultivation of corn after the coppice had been cut over. These temporary fields furnished a large portion of the corn and straw which they required. In 1862 the total area of the circle, 64,653 hectares (159,800 acres) with a population of 48,479, consisted of 74½ per

cent. forest (five-sixth hauberge) 10 per cent. meadows, and 13 per cent fields. Of the fields an average area of 6,940 acres was devoted to the production of corn, so that the addition of about 4,400 acres, which at that time was the aggregate area of coppice annually cut over and cultivated with rye, was an important addition to the corn-producing land. Even then, however, grain was imported largely, and now, with a vastly increased population, (77,674 in 1885) the importation of grain has largely increased. It is estimated that at present three-fourths of the corn consumed in the district has to be imported, hence the great importance f the system here described for increasing the corn producing area.

The custom of raising one or several crops of corn on forest land, and of letting the forest grow up again after the harvest, is an ancient custom in mountainous countries of all parts of Europe, nor is it limited to Europe, but is found in most other parts of the world. In India it is known as kumri in the south, as jhum in the east, as dhya in Central India, as khil in the north-west Himalaya, and as toungya in Burma. In Europe, however, the system has in so far developed, that the wood which grows up after the harvest is not all destroyed to furnish ashes for the field crops, but is otherwise utilized.

As the Siegen country was gradually opened up by railways, coal was imported, and the use of charcoal ceased. This diminished the value of the forest crop as far as the wood was concerned, but simultaneously the tanning industry, which was important as long ago as the fifteenth century, developed on a much larger scale, and at present bark is the most valuable produce of these lands. At Freudenberg, Siegen, and elsewhere in the circle, large tanneries exist which receive hides from all parts of the world and send away the leather prepared by them in all directions. The oak bark produced by these woods amounts to 85,000 cwt. a year.

Coppice and Field Crops in South Germany, Austria and France.

Coppice, combined with corn crops, likewise occupies extensive areas on the sandstone (Bunter sandstein) of the Odenwald, the mountain range situated between the rivers Main and Neckar, in the Grand Duchies of Hesse Darmstadt and Baden. Here this kind of coppice is known under the name "hackwald." Further south, in the valleys of the Kinzig and Rench, on the gneiss and granite of the Schwarzwald, it is known as "reutfeld," and under the same name it is practised in Wurtemberg and some parts of Switzerland. Circumstances in some respects are similar to those existing in the Siegen district and on the Moselle. The arable land is limited and the forest area large. Hence the desire to utilize part of the forest land for the production of corn and straw, whenever the ground has been cleared by cutting the coppice.

In upper Styria there existed formerly and probably now to some extent exists a similar management of forests, chiefly consisting of alder, birch, aspen and sallow. At the age of twenty-five to forty the coppice was cut, the larger wood used or sold, while the branches were burnt, one crop of rye and a second crop of oats being taken, after which the forest was allowed to grow up again. Wessely, in giving an account of this system in 1853, states that it is disappearing, and that many of the areas formerly thus treated are gradually being converted into spruce forests.

The practice called schiffeln which prevails in the mountainous tracts of the Eifel is only a variety of this system, differing in this, that small brushwood only and no regular forest grows up on the land after it has yielded a cereal crop. Near Cochem, for instance, the land on the plateau of the Eifel which is not under

the plough or kept as meadow land is either high forest, or coppice, or schiffel land, which is allowed to remain fallow for twelve years, between two crops of corn, and during that period gets covered with a dense matting of grass and bushes of broom and juniper. It is here the place to mention the system of *sartage*, which prevails in some mountainous districts of Belgium and France, particularly in the Ardennes, the continuation to the south of the "Hohe Venn." Sartage resembles the system here described, except that the coppice is worked under a longer rotation (twenty-four years), and that what is called open-air firing is more generally employed, that is, the sods of turf are not burnt in heaps, but small wood and branches are spread uniformly over the ground, and are fired during calm weather, with the needful precautions against spreading of the fire. The system is well described in that excellent work of Lorentz, "Cours elementaire de culture des bois," 4th edition, 1860, p. 424.

It is also treated in Bagneris' Elements of Sylviculture, English translation, 1882, p 125. Bagneris remarks, that the system is dying out in France. Zealous foresters, in Germany, as well as in France, have often condemned the system of combining coppice with field crops, as barbarous and indefensible. This, however, is not a correct view of the case. The system has certain positive advantages as far as the growth of the coppice is concerned; moreover, in many districts it admirably adapts itself to the requirements of the population. With due care and with the aid of diligent sowing and planting, the coppice can under this system be maintained in excellent condition. On the other hand, where it is not carefully supervised, the system is wasteful and unprofitable. As a matter of fact, in some districts the altered circumstances of the people may perhaps eventually lead to a gradual extinction of the system, whereas in other districts it will be maintained and will continue to contribute materially to the well being of the population.

High Forests and Field Crops.

The raising of cereal crops between two crops of high forest, or as an operation preparatory to the formation of new forests on waste lands, has been practised centuries ago in different parts of Europe. On the south-western portion of the mountain range which separates Bavaria from Bohemia, known as the "Bayrische Wald," a peculiar system of forest culture has existed since the fifteenth century. The forest which here chiefly consists of birch, is cut, a number of trees being left standing for seed. During one or two years rye, millet, potatoes and oats are raised on the ground, which had been fertilized by the ashes of the tops and branches. The birch seeds plentifully and regularly, and the ground soon gets covered with dense young growth, partly seedlings, partly coppice shoots. Where cattle have been kept out, the young forest is large enough to be cut and burnt after the lapse of twenty to forty years. Often, however, these areas, which are mostly private property and are known under the name of "Birken berge, Birken reuter," are indiscriminately opened to cattle.

In the large spruce forests on the mountains of upper Styria, during the first part of this century, the old wasteful system still existed of making wholesale clearances into which cattle were admitted immediately after cutting, no steps being taken to facilitate reproduction. When gradually the rapid development of the iron industry in those parts of Austria made wood (for charcoal) more valuable, one of the first measures to accelerate the regeneration of these forests, and thus to increase their productiveness, was to let out the clearances for cultivation, and to sow the spruce seed with rye. The stems were used for timber or charcoal, but tops, branches and trees without value were burnt. This system I

found in existence in 1865 on the mountains west of Bruck. A large extent of well stocked forest has been raised in this manner.

On the mountains of the Odenwald, which have already been mentioned in connection with fields and coppice, a system of raising high forest with the aid of cereal crops, called Roderbau, has existed from time immemorial. The results of this system may be seen in the shape of excellently stocked forests (aggregating over 2,000 hect., equals 4940 acres) of Scotch pine, spruce, silver fir and beech up to 120 years old, with a mean maturity increment per hectare of 6 cubic metres, or 85.7 cub. ft. per acre.

General Remarks on the System of Heavy Thinnings.

The system of heavy thinnings in high forests, combined with the raising of underwood, so as to produce as it were a forest consisting of two stories, the upper storey of trees which, like the oak and the Scotch pine, require much light, and the lower of shade supporting trees, such as beech and silver fir, has, as explained, first been applied in a methodical manner and upon a large scale to the oak and and beech in the Spessart about forty to fifty years ago. It is not impossible that the natural mixed forests of Scotch pine and beech in the Steigerwald, a beautiful forest-clad mountain range, situated east of the Spessart, may have given the idea of improving the growth of Scotch pine by means of an underwood of beech. To pure beech forest the principle was applied about 1830 in the Solling, a hilly country consisting of red sandstone, situated east of the Weser River. In these forests, which were burdened with heavy prescriptive rights of old standing, it was at that time found difficult to satisfy the requirements of right-holders in the matter of wood; and with the view of meeting immediate needs without at the same time impairing the productiveness of the forests, a new system of treatment was devised by Christian von Seebach, who at that time had the control of those forests under the Government of the former kingdom of Hanover. The period of rotation was 100 to 120 years, but all compartments which had attained that age had been gradually cut and renewed, and it became necessary to commence cuttings in forests 70 to 80 years old, of which, fortunately, there was a large area. In the areas taken in hand, about three-fifths of the trees were cut, the ground got covered with a dense growth of self-sown seedlings, with a few coppice shoots, and thirty to forty years later the crowns of the trees left standing had again closed and had formed a complete canopy. In this manner a portion of the crop was cut by way of anticipation, and what remained had more vigorous growth through the greater space given to the trees, the ground remaining all clothed with what may be termed the ground floor or the lower story of the forest. Subsequently, as the canopy of the older trees became complete, the undergrowth gradually went back, and most of it died. The forest, after it had attained the full age prescribed by the term of rotation, was then cut by means of successsive fellings, and renewed by self-sown seed in the usual manner.

Of late years this system of heavy thinnings has been somewhat overdone in various localities, and a great deal has been written upon the subject. It would lead too far on the present occasion to enter further into this matter.

Treatment.

The rotation in this forest is 120 years, divided into six periods of twenty years each, but it is part of the general system of treatment followed here to allow selected vigorous oak and Scotch pine trees to remain on the ground when a

piece of forest is cleared which had attained maturity, and thus to produce larger timber than the ordinary rotation would yield. This method is of old standing. In a portion of compartment Laubchesbusch (4) of the "Oberwald," there is a beech forest dating from about 1808, with a number of Scotch trees at that time 60 years old, which were allowed to remain standing when the original forest was cleared. The result, vigorous and well grown Scotch pine, 60 years older than the beech forest which surrounds them, proves the excellency of the arrangement. The old Scotch pine trees standing over the young growth of oak in Kaisertanne (2a) have already been mentioned. In this case the expediency of the measure is somewhat doubtful, the Scotch pine being rather aged (140 years), and, as a matter of fact, a portion of these old trees have already become dry, and had to be removed. In compartment Scheerwald (7) (Oberwald), which is under renewal at present, and where the last clearance is expected to be made in 1890, after a period of regeneration of about fifteen years, it is intended to hold over fifty to one hundred stems (oak and Scotch pine) per hect., the young growth consisting of oak and beech, with groups of silver fir and maple, planted chiefly where stumps have been rooted up.

In the regeneration of these forests, night frosts are one of the chief difficulties and it may here be mentioned that this is felt throughout the tract with comparatively dry climate, which extends from the foot of the Taunus range to the Rhine. In the Rhine valley, near Darmstadt, I am told that there is hardly a month in spring and summer when night frosts do not occur, and it is not impossible that there is a connection between the frequency of night frosts and a comparatively dry climate. This circumstance has, to some extent, influenced the treatment of these forests. Species which are readily damaged by frost, such as the beech and silver fir, can here only be raised under cover, and even the oak greatly profits while young by a certain amount of shelter. The combination of field crops with sylviculture, the system of partial clearances with underwood, and the method of allowing older trees to stand among the young forest, all these measures have a special value in this district, where a young forest growth is so much exposed to damage by night frosts.

Great stress is justly laid in this forest district upon the early cutting out of brushwood, of soft and inferior woods, and of woods which have served their object in acting as nurses to the more valuable kinds. A considerable amount of pruning also is done, always with the saw. Thinnings are commenced early, and under ordinary circumstances, are repeated once in ten years. The peculiar treatment of these forests, which results in mixed forests, consisting of different species, necessitates much attention to these operations, whereby the development of the more valuable kinds is generally promoted. Fortunately, the vicinity of the town makes it possible, as a rule, to sell nearly all the small wood which is the result of these operations. At times, however, the market gets overstocked, and these operations have then to be delayed.

Provisions of the Baden Forest Law on the Subject of Pasture.

32. In high forests, pasture is only admissable where the young growth has attained the age of thirty-five years in deciduous, and of thirty years in coniferous forests.

In coppice woods, pasture is not permitted unless the young growth in hard wood is twenty-five, and in soft wood, twelve years old. Where the forest is mixed, the age of the dominating kind, and in cases of doubt, the age of the hard wood, decides the point.

33. Forest pasture can only take place between the months of May and October.

34. Before sunrise and after sunset, cattle are not allowed in the forests; exceptions may be made in those cases where, on account of the distance, the cattle must remain in the forest. In such cases, however, they must be kept during the night in sheds, or within a ring fence.

35. Unless proprietors of cattle have a right to use certain paths, the line of road to be used in going to the pasture grounds and watering places, is indicated by the forest officers.

36. Sheep and goats are not admitted into the forests. In special cases, exceptions may be made by the forest authorities, with the consent of the forest proprietor.

37. Each head of horned cattle must be provided with a bell.

38. Each village community is obliged to employ one or several herdsmen for their cattle, as may be necessary.

The members of a village community may not drive their cattle themselves into the forests, nor may they send them with a herdsman of their own, separate from the herd of the village. Where a right of pasture does not belong to a village, but to an association of proprietors, they must entertain a common herdsman for their cattle. Single proprietors having rights of pasture entertain their own herdsmen.

FOREST DESTRUCTION: ITS CAUSES AND RESULTS.*

Forests of United States.

In his book, "The Earth as Modified by Human Action," Mr. George P. Marsh devotes considerable space to the effects upon the earth's surface and the conditions of human life which have followed the removal of forests both in Europe and America. Some of the more pertinent paragraphs are herewith appended:—

It is, perhaps, a misfortune to the American Union that the State Governments have so generally disposed of their original domain to private citizens.

Within the memory of almost every man of mature age timber was of so little value in the northernmost States that the owners of private woodlands submitted, almost without complaint, to what would be regarded elsewhere as very aggravated trespasses upon them. Persons in want of timber helped themselves to it wherever they could find it, and a claim for damages for so insignificant a wrong as cutting down and carrying off a few pine or oak trees was regarded as a mean-spirited act in a proprietor. The habits formed at this period are not altogether obsolete, and even now the notion of a common right of property in the woods still lingers, if not as an opinion at least as a sentiment. Under such circumstances it has been difficult to protect the forest, whether it belonged to the State or to individuals. Property of this kind is subject to plunder as well as to frequent damage by fire.

It is evidently a matter of the utmost importance that the public and especially land-owners be aroused to a sense of the dangers to which the indiscriminate clearing of the woods may expose, not only future generations, but the very soil itself.

Some of the American States, as well as the Governments of many European colonies, still retain the ownership of great tracts of primitive woodland. The State of New York, for example, has in its north-eastern counties a vast extent of territory in which the lumberman has only here and there established his camp, and where the forest, though interspersed with permanent settlements, robbed of some of its finest pine groves, and often ravaged by devastating fires, still covers far the largest proportion of the surface. Through this territory the soil is generally poor, and even the new clearings have little of the luxuriance of harvest which distinguishes them elsewhere. The value of the land for agricultural uses is therefore very small, and few purchases are made for any other purpose than to strip the soil of its timber. It is desirable that some large and easily accessible region of American soil should remain, as far as possible, in its primitive condition, at once a museum for the instruction of the student, a garden for the recreation of the lover of nature, and an asylum where indigenous tree and humble plant that loves the shade, and fish and fowl and four-footed beast may dwell and perpetuate their kind, in the enjoyment of such imperfect protection as the laws of a people jealous of restraint can afford them. The immediate loss to the public treasury from the adoption of this policy would be inconsiderable, for these lands are sold at low rates. The forest alone, economically managed, would without injury, and even with benefit to its permanence and growth, yield a regular income larger than the present value of the fee.

*Marsh; The Earth as Modified by Human Action.

The collateral advantages of the preservation of these forests would be far greater. Nature threw up those mountains and clothed them with leafy woods, that they might serve as a reservoir to supply with perennial waters the thousand rivers and rills that are fed by the rains and snows of the Adirondacks, and as a screen for the fertile plains of the central counties against the chilling blasts of the north wind which meet with no other barrier in their sweep from the north pole. The climate of northern New York even now presents greater extremes of temperature than that of southern France. The long-continued cold of winter is more intense, the short heats of summer even fiercer than in Provence, and hence the preservation of every influence that tends to maintain an equilibrium of temperature and humidity is of cardinal importance. The felling of the Adirondacks woods would ultimately involve, for northern and central New York, consequences similar to those which have resulted from the laying bare of the southern and western declivities of the French Alps, and the spurs, ridges and detached peaks in front of them.

It is true that the evils to be apprehended from the clearing of the mountains of New York may be less in degree than those which a similar cause has produced in southern France, where the intensity of its action has been increased by the inclination of the mountain declivities, and by the peculiar geological constitution of the earth. The degradation of the soil is perhaps not equally promoted by a combination of the same circumstances in any of the Atlantic States, but still they have rapid slopes and loose and friable soils enough to render widespread desolation certain if the further destruction of the woods is not soon arrested. The effects of clearing are already perceptible in the comparatively unviolated region of which I am speaking. The rivers which rise in it flow with diminished currents in dry seasons, and with augmented volumes of water after heavy rains. They bring down larger quantities of sediment, and the increasing obstructions to the navigation of the Hudson, which are extending themselves down the channel in proportion as the fields are encroaching upon the forest, give good grounds for the fear of irreparable injury to the commerce of the important towns on the upper waters of that river, unless measures are taken to prevent the expansion of "improvements" which have already been carried beyond the demands of a wise economy.

In the Eastern United States, wherever a rapid mountain slope has been stripped of wood, incipient ravines already plough the surface, and collect the precipitation in channels which threaten serious mischief in the future.

There is a peculiar action of this sort on the sandy surface of pine forest, and in other soils that unite readily with water, which has excited the attention of geographers and geologists. Soils of the first kind are found in all the Eastern States; those of the second are more frequent in the exhausted counties of Maryland, where tobacco is cultivated, and in the more southern territories of Georgia and Alabama. In these localities the ravines which appear after the cutting of the forest, through some accidental disturbance of the surface, or, in some formations through the cracking of the soil in consequence of great drought or heat, enlarge and extend themselves with fearful rapidity.

In Georgia and in Alabama, Lyell saw "the beginning of the formation of hundreds of valleys in places where the primitive forest had been recently cut down." One of these, in Georgia, a soil composed of clay and sand produced by the decomposition *in situ* of hornblendic gneiss with layers and veins of quartz, "and which did not exist before the felling of the forest twenty years previous," he describes as more than fifty-five feet in depth, three hundred yards in length, and from twenty to one hundred and eighty feet in breadth. He refers

to other cases in the same States "where the cutting down of the trees, which had prevented the rain from collecting into torrents and running off in sudden land floods, has given rise to ravines from seventy to eighty feet deep."

Similar results often follow in the north-eastern States from cutting the timber on the "pine plains" where the soil is usually of a sandy composition and loose texture.

Woodlands in European Countries.

In 1862, Rentzsch calculated the porportions of woodland in different European countries as follows:—

Norway	66.00	per cent.
Sweden	60.00	"
Russia	30.90	"
Germany	26.58	"
Belgium	18.52	"
France	16.79	"
Switzerland	15.00	"
Sardinia	12.29	"
Neapolitan States	9.43	"
Holland	7.10	"
Spain	5.52	"
Denmark	5.50	"
Great Britian	5.00	"
Portugal	4.40	"

In many places peat is generally employed as a domestic fuel, hence, though Norway has long exported a considerable quantity of lumber, and the iron and copper works of Sweden consume charcoal very largely, the forests have not diminished rapidly enough to produce very sensible climatic or even economical evils.*

Forests of Great Britain.

The proportion of forest is very small in Great Britain, where, on the one hand, a prodigious industrial activity requires a vast supply of ligneous material, but where, on the other, the abundance of coal, which furnishes a sufficiency of fuel, the facility of importation of timber from abroad, and the conditions of climate and surface combine to reduce the necessary quantity of woodland to its lowest expression.

With the exception of Russia, Denmark and parts of Germany, no European countries can so well dispense with the forests, in their capacity of conservative influences, as England and Ireland. Their insular position and latitude secure an abundance of atmospheric moisture; the general inclination of surface is not such as to expose it to special injury from torrents, and it is probable that the most important climatic action exercised by the forest in these portions of the British Empire, is in its character of a mechanical screen against the effects of wind. The

*Railway ties, or sleepers, are largely exported from Norway to India, and sold at Calcutta at a lower price than timber of equal quality can be obtained from the native woods.

From 1861 to 1870, Norway exported annually, on the average, more than 60,000,000 cubic feet of lumber.

Since 1872 the quantity of the annual exportation of timber from Norway and Sweden has steadily increased, and in 1881 it was so large that it might well excite the grave anxiety of all friends of the primeval forest.

due proportion of woodland in England and Ireland is, therefore, a question not of geographical, but almost purely of economical expediency, to be decided by the comparative direct pecuniary return from forest growth, pasturage and plough land.

In England, aboriculture, the planting and nursing of single trees has, until comparatively recent times, been better understood than sylviculture, the sowing and training of the forest. But this latter branch of rural improvement now receives great attention from private individuals, though not, so far as I know, from the National Government, except in the East Indian provinces, where the forestal department has assumed great importance. Many laws for the protection of the forest, as a cover for game and for the preservation of ship timber, were enacted in England before the 17th Century. The Statutes I Eliz. c. XV., XIII Eliz. c. V., and XXVII Eliz. c. XIX., which have sometimes been understood as designed to discourage the manufacture of iron, were obviously intended to prevent the destruction of large and valuable timber, useful in ordinary and naval architecture, by burning it for charcoal. The injury to the forges was accidental, not the purpose of the laws.

In Scotland, where the country is for the most part broken and mountainous, the general destruction of the forests has been attended with very serious evils, and it is in Scotland that many of the most extensive British forest plantations have now been formed.

Forests of France.

The preservation of the woods was one of the wise measures recommended to France by Sully, in the time of Henry IV., but the advice was little heeded, and the destruction of the forest went on with such alarming rapidity, that, two generations later, Colbert uttered the prediction: "France will perish for want of wood." Still, the extent of wooded soil was very great, and the evils attending its diminution were not so sensibly felt, that either the Government or public opinion saw the necessity of authoritative interference, and in 1750 Mirabeau estimated the remaining forests of the kingdom at seventeen millions of hectares (42,000,000 acres).

In 1860 they were reduced to eight millions (19,760,000 acres) or at the rate of 82,000 hectares (202,600 acres) per year.

In a country and a climate where the conservative influences of the forest are so necessary as in France, trees must cover a large surface and be grouped in large masses, in order to discharge to the best advantage the various functions assigned to them by nature. A large part of its territory is mountainous, sterile, and otherwise such in character or situation, that it can be more profitably devoted to the growth of wood than to any agricultural use.

The conservative action of the woods in regard to torrents and inundations has been generally recognized by the public of France as a matter of prime importance, and the Government has made this principle the basis of a special system of legislation in the protection of existing forests, and for the formation of new. The clearing of woodland, and the organization and functions of a police for its protection are regulated by a law bearing date June 18th, 1859, and provision was made for promoting the restoration of private woods by a statute adopted on the 28th July, 1860. This latter law appropriated 10,000,000, francs to be expended, at the rate of 1,000,000 francs per year, in executing or aiding the replanting of woods.

In 1865 the Legislative Assembly passed a bill amendatory of the law of 1860, providing, among other things for securing the soil in exposed localities by grading, and by promoting the growth of grass and the formation of greensward over the surface.

In 1863, France imported lumber to the value of twenty-five-and-a-half millions of dollars, and exported to the amount of six and a half millions of dollars. The annual consumption of France was estimated in 1886 at 212,000,000 cubic feet for building and manufacturing, and 1,588,500,000 for firewood and charcoal. The annual product of the forest soil of France does not exceed 70,000,000 cubic feet of wood fit for industrial use, and 1,300,000,000 cubic feet consumed as fuel. This estimate does not include the product of scattered trees on private grounds, but the consumption is estimated to exceed the production of the forests by the amount of about twenty millions of dollars.

The timber for building and manufacturing produced in France comes almost wholly from the forests of the State or of the communes.

Forests of Italy.

According to statistics, Italy had 17.64 per cent. of woodland in 1872, a proportion which, considering the character of climate and surface, the great amount of soil which is fit for no other purpose than the growth of trees, and the fact that much of the land classed as forest was then either very imperfectly wooded, or covered with groves badly administered, and not in a state of progressive improvement, might advantageously be doubled.

Taking Italy as a whole, we may say she is eminently fitted by climate, soil and superficial formation for the growth of a varied and luxuriant arborial vegetation. In such a country the promotion of forestal industry was among the first duties of her people.

The denudation of the central and southern Appenines and of the Italian declivity of the western Alps began at a period of unknown antiquity, but it does not seem to have been carried to a very dangerous length until the foreign conquests and extended commerce of Rome created a greatly increased demand for wood for the construction of ships and for military material.

The eastern Alps, the western Appenines, and the maritime Alps retain their forests much later; but even here the want of wood, and the injury to the plains and the navigation of the rivers by sediment brought down by the torrents, led to legislation for the protection of the forests by the Republic of Venice at various periods between the fifteenth and nineteenth centuries,* by that of Genoa, as early at least as the seventeenth, and both these Governments, as well as several others, passed laws requiring the proprietors of mountain land to replant the woods.

Although no country has produced more able writers on the value of the forest and the general consequences of its destruction than Italy, yet the specific geographical importance of the woods, except as a protection against inundations has not been so clearly recognized in that country as in the States bordering it on the north and west. It must be remembered that the sciences of observation did not become knowledges of practical application till after the mischief was

*According to Hummel, the desolation of the Karsts, the high plateau lying north of Trieste, one of the most parched and barren districts in Europe, was owing to the felling of its woods centuries ago to build the navies of Venice. "Where the miserable peasant of the Karst sees nothing but bare rock swept and scoured by the raging Bora, the fury of this wind was once subdued by mighty firs which Venice recklessly cut down to build her fleets."—*Physicke Geographe*, p. 32.

already mainly done and even forgotten in Alpine Italy, while its evils were just beginning to be sensibly felt in France when the claims of natural philosophy as a liberal study were first acknowledged in modern Europe. The former political condition of the Italian peninsula would have effectually prevented the adoption of a general system of forest economy, however clearly the importance of a wise administration of this great public interest might have been understood. The woods which controlled and regulated the flow of the river-sources were very often in one jurisdiction; the plains to be irrigated or to be inundated by floods and desolated by torrents in another.

Action under a single government can alone render practicable the establishment of such arrangements for the conservation and restoration of the forests, and for the regulation of the flow of the waters as are necessary for the full development of the yet unexhausted resources of that fairest of lands, and even for the maintenance of the present condition of its physical geography.

Forests of Germany.

Germany, including a considerable part of the Austrian Empire, from character of surface and climate, and from the attention which has long been paid in all the German States to sylviculture and forestry, is in a far better condition in this respect than its more southern neighbors; and though in the Alpine Provinces of Bavaria and Austria the same improvidence which marks the rural economy of the corresponding districts of Switzerland, Italy, and France has produced effects hardly less disastrous, yet, as a whole, the German States must be considered as in this respect the model countries of Europe. Not only is the forest area in general maintained without diminution, but new woods are planted where they are specially needed, and though the slow growth of forest trees in those climates reduces the direct pecuniary returns of woodlands to a minimum, the governments wisely persevere in encouraging this industry. The exportation of sawn lumber from Trieste is large, and in fact the Turkish and Egyptian markets are in great part supplied from this source.

As an instance of the scarcity of fuel in some parts of Bavaria, where, not long since, wood abounded, the fact may be mentioned that the water of salt springs is, in some instances, conveyed to the distance of sixty miles, in iron pipes, to reach a supply of fuel for boiling it down.

The Austrian Government has made energetic efforts for the propagation of forests in Tyrol and on the desolate wastes of the Karst. In 1866 upwards of 400,000 trees had been planted on the Karst, and great quantities of seed sown. The results of this important experiment are said to be encouraging, (*Chronique Forestiere* in the *Revue des Eaux et Forets, Feb. 1870.*) Later accounts state that the Government nurseries of the Karst supplied between 1869 and 1872, 26,000,000 young forest trees for planting, and that of 70,000 ash trees planted in the Karst scarcely one failed to grow.*

Forests of Russia.

Russia, which we habitually consider as substantially a forest country, which has in fact a large proportion of woodland, is beginning to suffer seriously for want of wood. Jourdier observes:—"Instead of a vast territory with immense forests, which we expect to meet, one sees only scattered groves thinned by the

* For information respecting the forests of Germany, as well as other European countries, see the very valuable *Manuale d'Arte Forestale* of Siemoni, 2d. edizione, Firenze, 1872.

wind or by the axe of the *moujik*, grounds cut over and more or less recently cleared for cultivation. There is probably not a single district in Russia which has not to deplore the ravages of man or fire, those two great enemies of Muscovite sylviculture. This is so true, that clear sighted men already foresee a crisis which will become terrible, unless the discovery of great deposits of some new combustible, as pit coal or anthracite, shall diminish its evils."

Hohenstein, who was long professionally employed as a forester in Russia, describes the consequences of the general war upon the woods in that country as most disastrous and as threatening still more ruinous evils. The river Volga, the life artery of Russian internal commerce, is drying up from this cause, and the great Muscovite plains are fast advancing to desolation like that of Persia.

Economy of Woodlands.

The action of the forest, considered merely as a mechanical shelter to grounds lying to the leeward of it, might seem to be an influence of too restricted a character to deserve much notice, but many facts concur to show that it is a most important element in local climate. Experience, in fact, has shown that mere rows of trees, and even much lower obstructions, are of essential service in defending vegetation against the action of the wind. Hardy proposes planting in Algeria, belts of trees at the distance of 100 metres from each other, as a shelter, which experience has proved to be useful in France.

In the report of a committee appointed in 1836 to examine an article of the forest code of France, Arago observes:—"If a curtain of forest on the coast of Normandy and of Brittany were destroyed, these two Provinces would become accessible to the winds from the west, to the mild breezes of the sea. Hence a decrease of the cold of the winter. If a similar forest were to be cleared on the eastern border of France, the glacial east wind would prevail with greater strength, and the winters would become more severe. Thus the removal of a belt of wood would produce opposite effects in the two regions."

It is thought in Italy that the clearing of the Appenines has very materially affected the climate of the valley of the Po. It is asserted in *Le Alpi che cingono l'Italia* that:—"In consequence of the felling of the woods on the Appenines, the sirroco prevails greatly on the right bank of the Po, in the Parmesan territory, and in a part of Lombardy; it injures the harvests and the vineyards, and sometimes ruins the crops of the season."

According to the same authority, the pinery of Porto, near Ravenna—which is twenty miles long, and is one of the oldest pine woods in Italy—having been replanted with resinous trees after it was unfortunately cut, has relieved the city from the sirroco to which it had become exposed, and in a great degree restored its ancient climate.*

The local retardation of spring so much complained of in Italy, France, and Switzerland, and the increased frequency of late frosts at that season, appear to be ascribable to the admission of cold blasts to the surface, by the felling of the forests, which formerly both screened it as by a wall and communicated the

*The following well attested instance of a local change of climate is probably to be referred to the influence of the forest as a shelter against cold winds. To supply the extraordinary demand for Italian iron, occasioned by the exclusion of English iron in the time of Napoleon I, the furnaces of the valleys of Bergamo were stimulated to great activity. "The ordinary production of charcoal not sufficing to feed the furnaces and the forges, the woods were felled, the copses cut before their time, and the whole economy of the forest was deranged. At Piazzatorre there was such a devastation of the woods, and consequently such an increased severity of climate, that maize no longer ripened. An association, formed for the purpose, effected the restoration of the forest and maize flourishes again in the fields of Piazzatorre." Report by G. Rosa, in Il Politecnico, Dicembre, 1861, p. 614.

warmth of their soil to the air and earth to the leeward. Caimi states that since the cutting down of the woods of the Apennines, the cold winds destroy or stunt the vegetation, and that, in consequence of "the usurpation of winter on the domain of spring," the district of Mugello has lost its mulberries, except the few which find, in the lee of buildings, a protection like that once furnished by the forests.

Influence of the Forest on the Flow of Springs.

It is an almost universal and I believe well-founded opinion that the protection afforded by the forest against the escape of moisture from its soil by superficial flow and evaporation, insures the permanence and regularity of natural springs, not only within the limits of the wood, but at some distance beyond its borders, and thus contributes to the supply of an element essential to both vegetable and animal life. As the forests are destroyed, the springs which flow from the woods, and consequently the greater watercourses fed by them, diminish both in number and in volume. This fact is so familiar throughout the American States and the British Provinces that there are few old residents of the interior of those districts who are not able to testify to its truth as a matter of personal observation.

The hills in the Atlantic States formerly abounded in springs and brooks, but in many parts of these States, which were cleared a generation or two ago, the hill pastures now suffer severely from drought, and in dry seasons furnish to cattle neither grass nor water.

Almost every treatise on the economy of the forest adduces facts in support of the doctrine that the clearing of the woods tends to diminish the flow of springs and the humidity of the soil.

Marchand cites the following instances:—

"Before the felling of the woods within the last few years, in the valley of the Soulce, the Combe-es-Mounin and the Little Valley, the Sorne furnished a regular and sufficient supply of water for the iron works of Unterwyl, which was almost unaffected by drought or by heavy rains. The Sorne has now become a torrent, every shower occasions a flood, and after a few days of fine weather, the current falls so low that it has been necessary to change the water wheels, because those of the old construction are no longer able to drive the machinery, and at last to introduce a steam engine to prevent the stoppage of the works for want of water."

"The spring of Combefoulat, in the commune of Seleate, was well known as one of the best in the country: it was remarkably abundant, and sufficient, in the severest droughts, to supply all the fountains of the town; but as soon as considerable forests were felled in Combe-de-pré Martin and in the valley of Combefoulat, the famous spring, which lies below these woods, has become a mere thread of water, and disappears altogether in times of drought."

"The Wolf spring, in the commune of Soubey, furnishes a remarkable example of the influence of the woods upon fountains. A few years ago this spring did not exist. At the place where it now rises, a small thread of water was observed after very long rains, but the stream disappeared with the rain. The spot is in the middle of a very steep pasture inclining to the south. Eighty years ago, the owner of the land, perceiving that young firs were shooting up in the upper part of it, determined to let them grow, and they soon formed a flourishing grove. As soon as they were well grown, a fine spring appeared in place of the occasional rill, and furnished abundant water in the longest droughts. For forty or fifty years this spring was considered the best in the Clos du Doubs.

A few years since, the grove was felled, and the ground turned again to a pasture. The spring disappeared with the wood, and is now as dry as it was ninety years ago."

Importance of Snow.

The quantity of snow that falls in extensive forests far from the open country, has seldom been ascertained by direct observation, because there are few meteorological stations in or near the forest. According to Thompson, the proportion of water which falls in snow in the northern States does not exceed one-fifth of the total precipitation, but the moisture derived from it is doubtless considerably increased by the atmospheric vapour absorbed by it, or condensed and frozen on its surface. Though much snow is intercepted by the trees, and the quantity on the ground in the woods is consequently less than in open land in the first part of the winter, yet most of what reaches the ground at that season remains under the protection of the wood until melted, and as it occasionally receives new supplies, the depth of snow in the forest in the latter half of winter is considerably greater than in the cleared fields. Measurements in a snowy region in New England in the month of February, gave a mean of thirty-eight inches in the open ground and forty-four inches in the woods, but the actual difference between the quantity of snow in the woods and that in the open ground in the latter part of winter, is greater than the measurements would seem to indicate. In the woods the snow, which remains constant, is consolidated by a pressure, while in the open ground, being blown off, or thawed several times in the course of the winter, it seldom becomes as densely packed as in the woods, except in the bottom of valleys or other positions where it is sheltered both from wind and sun.

The water imbibed by the soil in winter sinks until it meets a more or less impermeable or a saturated stratum, and then, by unseen conduits, slowly finds its way to the channels of springs, or oozes out of the ground in drops, which unite in rills, and so all is conveyed to the larger streams, and by them finally to the sea.

Importance of Summer Rains.

In countries like the United States (and Canada) where rain is comparatively rare during the winter and abundant during the summer half of the year, common observation shows that the quantity of water furnished by deep wells and by natural springs depends almost as much upon the rains of summer as upon those of the rest of the year, and, consequently, that a large portion of the rain of that season must find its way into strata too deep for the water to be wasted by evaporation.

According to observation at one hundred military stations in the United States, the precipitation ranges from three and one-quarter inches at Fort Yuma in California, to about seventy-two inches, at Fort Pike, Louisiana, the mean for the entire territory, not including Alaska, being thirty-six inches. In the different sections of the Union it is as follows:—

Northeastern States	41 inches.
New York	36 "
Middle States	40½ "
Ohio	40 "
Southern States	51 "
S. W. States and Indian Territories	39½ "
Western States and Indian Territories	30 "
Texas and New Mexico	24½ "
California	18½ "
Oregon and Washington Territory	50 "

The mountainous regions, it appears, do not receive the greatest amount of precipitation.

The average downfall of the Southern States, bordering on the Atlantic and the Gulf of Mexico, exceeds the mean of the whole United States, being no less than fifty-one inches, while on the Pacific coast it ranges from fifty to fifty-six inches.

Increased Demand for Lumber.

With increasing population and the development of new industries come new drains upon the forests from the many arts for which wood is the material. The vast extension of railroads, of manufactures and the mechanical arts, of military armaments, and especially of the commercial fleets and navies of Christendom, within the present century have incredibly augmented the demand for wood, and but for improvements in metallurgy and the working of iron, which have facilitated the substitution of that metal for wood, the last twenty-five years would have almost stripped Europe of her last remaining tree fit for these uses.

Let us take the supply of timber for railroad ties. According to Clavé, France had in 1862, 9,000 kilometres of railway in operation, 7,000 in construction, half of which is built with a double track. Adding turn-outs and extra tracks at stations, the number of ties required for a single track is stated at 1,200 to the kilometre, or, as Clavè computes, for the entire net-work of France, 58,000,000. This number is too large for 16,000 + 8,000 for the double track half way = 24,000, and 24,000 × 1,200 = 28,800,000. Gandy states in 1863, that 2,000,000 trees had been felled to furnish the ties for the French railroads, and as the ties must be occassionally renewed, and new railways have been constructed since 1863, we may probably double this number.

The United States had in operation on the first of January, 1872, 61,000 miles, or about 97,000 kilometres of railroad. Allowing the same proportion as in France, the United States railraods required 116,400,000 ties. The number of ties annually required for these railways was estimated at 30,000,000. The annual expenditure for lumber, buildings, repairs and cars was estimated at $38,000,000, and the locomotive fuel, at the rate of 19,000 cords of wood per day, at $50,000,000.

The walnut trees cut in Italy and France to furnish gunstocks to the American Army, during the late civil war, would alone have formed a considerable forest.

The consumption of wood for lucifer matches is enormous, and thousands of acres in extents are purchased and felled, solely to supply timber for this purpose. The United States Government tax, at one cent per hundred, produced $2,000,000 per year, which shows a manufacture of 20,000,000,000 matches. Allowing nothing for waste, there are about fifty matches to the cubic inch of wood or 86,400 to the cubic foot, making in all upwards of 230,000 cubic feet, and as only straight grained wood, free from knots, can be used for this purpose, not less than three or four thousand well-grown pines are required.

Add to all this the supply of wood for telegraph poles, wooden pavements, wooden wall tapestry paper, shoe-pegs, wooden nails, and wood-pulp and other recent applications which ingenuity has devised, and we have an amount of consumption for entirely new purposes, which is really appalling. Wooden field and garden fences are very generally used in America, and some have estimated the consumption of wood for this purpose as not less than that for architectural uses.

Fully one-half our vast population is lodged in wooden houses; and barns and country out-houses of all descriptions are almost universally of the same material.

The consumption of wood in the United States as fuel for domestic purposes, for charcoal, for brick and lime-kilns, for breweries and distilleries, for steam-boats, and many other uses, defies computation, and is vastly greater than is employed in Europe for the same ends. For instance, in rural Switzerland, cold as is the winter climate, the whole supply of wood for domestic fires, dairies, breweries, distilleries, brick and lime-kilns, fences, furniture, tools, and even house-building and small smitheries, exclusive of the small quantity derived from the trimmings of fruit trees, grape vines, and hedges, and from decayed fences and buildings, does not exceed *two hundred and thirty cubic feet* or less than two cords a year, per household. The annual consumption of firewood by single families in France has been estimated at from two and a half to ten Paris cords of 134 cubic feet.

The report of the Commissioners on the Forests of Wisconsin, 1867, allows three cords of wood to each person for household fires alone. Taking families at an average of five persons, we have eight times the amount consumed by an equal number of persons in Switzerland for this and all other purposes to which this material is ordinarily applicable. It has been estimated that in the cold climate of Sweden, 144 solid, or 200 loose cubic feet of pine or fir are required per head of the population. The consumption in Norway is about the same.

Evergreen trees are thoughtlessly destroyed in immense numbers for the purpose of decoration and on festive occasions. Thrifty young groves of evergreen of considerable extent have been completely destroyed in this reckless way.

France employs 1,500,000 cubic feet of oak per year for brandy and wine casks, which is about half her annual consumption of that material; and it is not a wholly insignificant fact that, according to Rentzsch, the quantity of wood used in parts of Germany for small carvings and for children's toys is so large that the export of such objects from the town of Sonneberg alone amounted in 1858, to 60,000 centner, or three thousand tons weight.

In an article in the Revue des Eaux et Forets for November, 1868, it is stated that 200,000 dozens of drums for boys were manufactured per month in Paris; this is equivalent to 28,800,000 per year, for which 56,000,000 drumsticks are required. The consumption of matches in France is given at 7,200,000,000.

Effects of Forest Fires.

Only trees fit for industrial uses fall before the lumberman's axe, but the fire destroys, almost indiscriminately, every age and every species of tree. While, then, without fatal injury to the younger growths, the native forest will bear several "cuttings over" in a generation—for the increasing value of lumber brings into use, every four or five years, a quality of timber which had been before rejected as unmarketable—a fire may render the declivity of a mountain unproductive for a century.

Aside from the destruction of the trees and the laying bare of the soil, and consequently the free admission of sun, rain, and air to the ground, the fire of itself exerts an important influence on its texture and condition. It cracks and sometimes even pulverizes the rocks and stones upon and near the surface; it consumes a portion of the half decayed vegetable mould which

served to hold its mineral particles together, and to retain the water of precipitation, and thus loosens, pulverizes and dries the earth; it destroys reptiles, insects, and worms, with their eggs and the seeds of trees and of smaller plants; it supplies, in the ashes which it deposits on the surface, important elements for the growth of a new forest clothing as well as of the usual objects of agricultural industry; and by the changes thus produced, it fits the ground for the reception of a vegetation different in character from that which had spontaneously covered it. These new conditions help to explain the natural succession of forest crops, so generally observed in all woods cleared by fire and then abandoned. There is no doubt, however, that other influences contribute to the same result, because effects more or less analogous follow when the trees are destroyed by other causes, as by high winds, by the woodman's axe, and even by natural decay. *

When the forest is left to itself the order of succession is constant, and its occasional inversion is always explicable by some human interference. It is curious that the trees which require most light are content with the poorest soils, and *vice versa*. The trees which first appear are also those which propagate themselves farthest to the north.

The birch, the larch, and the fir, bear a severer climate than the oak or the beech.

The difficulty of protecting the woods against accidental or incendiary fires is one of the most discouraging circumstances attending the preservation of natural and the plantation of artificial forests. In the spontaneous wood the spread of fire is somewhat retarded by the general humidity of the soil, and of the beds of leaves which cover it. But in long droughts the superficial layer of leaves and the dry fallen branches become as inflammable as tinder, and the fire spreads with fearful rapidity, until its further progress is arrested by want of material, or more rarely, by heavy rains, sometimes caused, as many meteorologists suppose, by the conflagration itself.

* Trees differ in their power of resisting the action of forest fires. Different woods vary greatly in their combustibility, and even when the bark is scarcely scorched, trees are, partly in consequence of physiological character, and partly from the greater or less depth at which their roots habitually lie below the surface, differently affected by running fires. The white pine, *Pinus Strobus*, as it is the most valuable, is also perhaps the most delicate tree of the American forest, while its congener, the northern pitch-pine, *Pinus Rigida*, is less injured by fire than any other tree of our country. Experienced lumbermen maintain that the growth of this pine was even accelerated by a fire brisk enough to destroy all other trees.

UNITED STATES CONSULAR REPORTS ON EUROPEAN FORESTRY.

There is a great deal of useful information respecting European systems of forestry contained in a volume entitled "Forestry in Europe," published at Washington, Government Printing Office, 1887, from which the following extracts have been made:—

COPY OF CIRCULAR.

DEPARTMENT OF STATE,
WASHINGTON, November 30, 1886.

To the Consular Officers of the United States:

GENTLEMEN:—*You are instructed to prepare a report covering the following questions on Forest Culture and Forest Preservation. I would ask you to devote especial attention to the practical phases of the question, that your replies may serve as a basis for framing forestry legislation in this country, where the subject is of great and increasing importance.*

1. Areas under forests, distinguishing, where possible, between State and private areas.

2. Common forests, if any, and privileges of the population in them. If pasture is permitted, how are the trees, etc., protected?

3. Organization and functions of government forest bureaus.

4. Revenues from government forests, cost of maintaining or managing forests; profits of forest cultivation.

5. Forest planting and culture; methods; bounties, if any; schools, their organization and courses of study.

6. Destruction of forests, causes and results.

7. Reclamation of sand dunes, or waste places by tree planting.

8. Sources of lumber supply; trade in lumber, bounties on importation, if any, and customs duties.

9. Give the names of three reliable sellers of seeds and shoots in your district.

10. Transmit to the Department copies and translations of the forest laws of the district in which you reside. (The general laws should be forwarded by the Consul-General; the local laws, by the Consul.)

I am, Gentlemen,

Your Obedient Servant,

JAMES D. PORTER,
Assistant Secretary.

Weights, Measures and Currency.

Cental	Equals	220 pounds.
Centner meter	"	221.5 pounds.
Florin	"	35.9 cents.
Franc	"	19.3 cents.
Hectare	"	2.471 acres.
Joch	"	1.42 acres.
Kilogram	"	2.2046 pounds.
Mark	"	23.8 cents.

AUSTRIA HUNGARY.—REPORT OF CONSUL-GENERAL JUSSEN.

Government Control.

The forest laws of Austria prescribe and control not only the culture of the forests belonging to the imperial domain, but also all woodlands which are the property of municipalities, private corporations or private individuals, and are based upon the theory of paternal government.

If the law as it stands is enforced not a tree can be cut nor a load of dry leaves gathered in a forest which is situated in Austria except in accordance with certain rules and restrictions, and although there may be much in these laws which may serve for framing future forestry legislation in the United States, the greater portion of the enactment is in direct conflict with the American idea of home government and property rights.

The Austrian Empire is unusually rich in forest lands. There is no lack of dense woods in any of its Provinces, except in Dalmatia and Istria and in the territory near Trieste, and the culture of forest lands may be called exemplary, especially in Bohemia, Moravia, Upper Austria, Silesia and Salzburg.

The yield of these vast forests, although it is said to be on the decline, still far exceeds the home demands, and large quantities are exported.

Areas Under Forests, Public and Private.

The latest statistics place the total area of the productive land of the Empire at 28,406,530 hectares; of these total numbers of hectares 9,227,061.20 hectares are forest lands, and these again are divided into imperial (State), municipal and private forests, as follows:—Imperial forests, 952,689.96 hectares; municipal forests, 1,297,238.21 hectares. The private forests, therefore, cover about 32 per cent. of the total area of the productive land of the Empire.

Common Forests and Privileges of the Population in Them.

As common forests of the Empire only the woodlands belonging to the several cities and villages can properly be denominated. The residents of these cities and villages undoubtedly enjoy certain privileges as to the use of these forests, by virtue of the local laws and regulations. I am not in a position, however, to have access to these local regulations, which undoubtedly differ in the different communities, but are one and all subject to the general law on forest culture and preservation hereinafter cited. This general law, if strictly enforced, furnishes the means of ample protection against any injury that may possibly threaten these common forests by the wasteful or careless exercise of any privilege granted by local enactment.

ORGANIZATION AND FUNCTIONS OF GOVERNMENT FOREST BUREAUS.

The cultivation and preservation of the forests of the Empire of Austria and the administration of the laws with reference thereto are entrusted to the Ministry of Agriculture. The right of appeal, however, in certain contested cases to the Ministry of the Interior is reserved.

Under the supervision of the Minister of Agriculture the several Provincial presidents (*statthalters*) are authorized to execute the forest laws and regulations, and as next in authority to these *statthalters* the several district captains are empowered to enforce the laws in question, and to exercise a general authority, supervision and control over all the subordinate officers charged with the execution of the forest laws, and forest police regulations. This subordinate class of forestry officers is composed of two classes:—

1. The officers who have entered the service permanently, after passing the requisite examination, and are in the line of promotion, like officers of the regular army.

2. The volunteer officers who for the sake of pursuing their studies and adding practical experience to theoretical knowledge, accept the position in the forest service as an honorable distinction, but receive a salary in proportion to the extent of their field of action and responsibility.

This latter class, however, like the first, must have passed certain examinations, proving their qualifications before they can enter the service as such volunteers.

The professional and regular forest officers in the Empire are classified as follows:—

A. Forest Inspectors.

2. Chief forest counsellors (called oberforesträthe).

5. Forest counsellors (or foresträthe).

7. Chief forest commissaries (called oberforestcommissäre).

B. Forest Technicists.

Forest inspection commissaries (called forestthechniker).

C. Forest Wards Belonging to the Category of Servants.

Forest wards, class I, salary per annum, 500 florins.

Forest wards, class II, salary per annum, 400 florins.

Forest wards, class III, salary per annum, 300 florins.

The forest inspectors are charged with the duty of superintending the execution of all forest laws, of examining the condition of the forest, fostering and furthering instructions in forest culture and acting as adjuncts to the Statthalter.

From early spring until late in the fall the forest inspector should visit and inspect the forests in his district and make a report of each inspecting tour to the Statthalter.

The Statthalter may also order the forest inspector to make special inspecting tours in addition to the regular tour.

The forest inspector is required to inspect the offices of the district captains with reference to forest affairs.

The instructions to forest inspectors contain sufficient points, elaborately presented, to fill a moderate-sized pamphlet, and the gist of the whole matter is that the forest inspector acts as a paternal adviser, and if need be as an imperative commander to all owners of forests in the empire, as well as a superintendent of imperial forests.

He controls and commands private owners as to the manner and order in which they should cut their timber, as to the necessity of replanting, the preventing of waste, the preservation of timber against floods, and as to the danger and injury threatening from insects, as to the fitness and capacity of the subordinate forest inspectors and hunters and forest wards to be employed by these owners; in short, there is not a single act of ownership which the holder of the titled deeds of woodland could possibly exercise over his own domain which is not directly under the control, and which does not require the approval of the forest inspector.

In the light of these instructions it is not at all paradoxical to say that the owner of forest land in Austria must exercise extraordinary care not to be guilty of trespass upon his own lands. There can be no question, however, that this paternal control has achieved most excellent practical results, though it is said that the discipline of forest officials has been lax, and that the laws and instructions have not been enforced with uniform strictness. The forest technicists and forest wards are the subordinate officers of the forest, instruments by which the duties above enumerated and imposed upon the forest inspectors are practically performed.

Forest Register (Waldkataster).

In pursuance of a decree of the Ministry of Agriculture, under date of July 3, 1873, the respective forest officers are required to keep a forest register of each district, which specifies the number of acres covered by forest, its condition, state of growth, etc.

In connection with this register maps are prepared and kept open for inspection at the offices of the district captains upon which the condition and extent of the several forests in the districts are shown.

At the close of each year a report about the progress of forest culture, etc., is to be made to the Ministry of Agriculture, which report is to be published in the *Landes Zeitung*.

The total number of forest officers of all grades, public and private, employed in Austria, reaches the respectable figure of 31,826.

Revenues from Government Forests—Cost of Maintaining or Managing Forests—Profits of Forest Cultivation.

On the point of the profits of Government forests there are absolutely no statistics published in the Empire, so far as I have been able to ascertain, except those given in the budget under the head of forest revenues and expenditures. The last budget published places:—

The forest revenues, p. a. florins	3,951,650
The forest expenditures, p. a. florins	3,546,240
Profit of State forests	405,410

These net proceeds of an area of government forest land, containing 952,689.96 hectares, certainly seem very inconsiderable, but in order to estimate

the true value of these forests to the Empire, their influence upon the climate, the rainfalls, and the consequent benefit to agricultural land, as well as to the health of the population, should be taken into consideration.

A direct benefit also results to the population from the employment of numerous officers attending to the cultivation and preservation of these forests, all of whom are paid and supported by the profits derived from the culture.

It cannot be contended, therefore, that the people are taxed in order to support a small army of forest officers, who are actually producers, earning more than they expend.

I find on an examination of the meagre statistics to which I have had access that the profits of forest land culture have materially increased during the last fifty years.

The Kataster (Real Estate Register) shows that in Lower and Upper Austria the net profit per joch was estimated at 1.41 florins in the year 1830, while in the year 1880 this estimate rose to 2.62 florins per joch, an increase of almost 100 per cent., an incontrovertible proof that the forest laws of Austria, which were passed in 1852, have been of great practical benefit to forest culture.

This benefit is proven, not only by the increased net proceeds of a given area of forest lands, but also by the growth and greater extent of the area itself.

Forest Planting and Culture Methods.—Bounties if any.—Schools, their Organization and Course of Study.

The method of forest planting and culture prevailing in Austria are quite particularly prescribed in the forest laws. There are no bounties paid in the Empire for planting or replanting of forests.

Schools.

The schools for forest culture were transferred in 1878 from the Minister of Agriculture to the Minister for Culture and Education, but all organic order and appointments of professors are made by the Ministers of Culture and Education with the concurrence of the Minister of Agriculture.

While there are undoubtedly numerous provisions of the forest culture law which cannot be applied or enforced in the United States, the system inaugurated in Austria to fit and educate young men for the duty of enforcing this law seems beyond all question worthy of imitation to the fullest extent.

These Austrian schools for forest culture consist of :—

A. University (hochschule).

B. Middle or preparatory schools.

C. Elementary or lower schools.

The university (hochschule) is situate in Vienna; it was founded in October, 1875.

Its aim and purpose is the highest possible scientific education in land and forest culture, All expenditures are borne by the State. The semesters (terms) are limited to six—that is, complete instruction is not perfected under six semesters.

The Students.

The students are either ordinary or extraordinary hearers. The ordinary hearer must produce a testimonial as a graduate of a gymnasium (college) or high school (*oberealschule*)—a testimonial which would also admit the students to any university.

Whoever does not possess the qualification of an ordinary hearer may be admitted as an extraordinary hearer if he is eighteen years old and has that degree of preparatory education which will enable him to understand the lectures.

Guests may be admitted to single lectures on notice of the the dean (rector). All hearers are subject to the dicipline regulations of the university.

Immatriculation, Tuition Fee, and Laboratorium Tax.

The immatriculation fee is five florins for all hearers. The ordinary hearers pay a tuition fee of twenty-five florins at the beginning of the semester (term).

Extraordinary hearers pay 1.50 florins (per week) for each lecture.

Ordinary hearers, if poor, may, as a reward for great diligence, be released from the payment of tuition fees if the college of professors so decides.

The laboratorium tax is five florins for fifteen hours.

Certificates of Attendance.

The attendance at lectures is certified to at the end of each semester. In case of non attendance, the fact is stated on the certificate. The certificates are to be delivered to the dean for examination.

Examinations and Testimonials.

The examinations are public and conducted under the supervision of the dean (rector).

In deciding the degree of succes in examinations, not only the written school examination, but also the labor in the laboratory and the authenticated studies in chambers are to be taken into consideration.

Every ordinary hearer has the right to be admitted to the state examination if he so desires.

Regular and full diplomas are only issued to ordinary hearers.

Extraordinary hearers can claim only a testimonial certifying to their attendance at lectures, good conduct and general progress in their studies.

Terms of Examinations for Diplomas in Forest Culture.

First Group.

1. Physics with climatology.
2. Chemistry.
3. General and special botany.
4. Mineralogy and geology.
5. Mathematics.

6. Geodesy.
7. Mechanics.
8. Geometry.
9. National economy.

Second Group.

1. Forest culture.
2. Forest felling with forest technology.
3. Forest preservation with forest zoology.
4. Forest laws
5. Forest yield, regulation and management.
6. Forest statistics.
7. Forest engineering.

The examinations are both oral and in writing, during which the use of, and reference to, books and memoranda are not permitted.

Only ordinary hearers who have performed the three years' course in the university are admitted to examinations for diplomas.

If the student desires to enter the service of the State as a forest officer, he must subject himself to, and pass two State examinations, after he has obtained his university diploma.

The subjects of the first State examination are the following;—Physics, climatology, chemistry, botany, geology, higher mathematics, geodesy, and national economy.

The second State examinatiom embraces the subjects of culture, use and yield of forest lands, calculations on values of forests, forest machinery, and forest laws.

These State examinations are conducted orally and in public. The State issues diplomas to the successful candidates.

Middle or Preparatory Schools for Forest Culture.

Three of these preparatory schools have been established in the Empire, one at Eulenberg, another at Weisswasser, and the third at Lunberg.

The conditions of admission to the Eulenberg school are the following:—

1. The applicant must be a graduate of a lower gymnasium (under gymnasium, or *unterrealschule*, preparatory college.)

2. He must have served with good success for two, or at the very least, one year, as the apprentice of a forest official.

3. He must not be less than seventeen and not more than twenty-four years old.

4. Must be in perfect health and vaccinated.

5. Must furnish security as to means required for instruction, clothing and support.

6. Must pass a preliminary examination by the teachers of the school.

The scholars, whose numbers shall not exceed twenty to twenty-five per annum, reside at the institute.

The branches taught embrace mathematics, field engineering, drawing, natural history, forest culture, forest laws, business coorrespondence, office routine business, and hunting.

The conditions of admission to the other two middle schools are of about the same character, and nearly the same branches are taught there, all calculated to fit the student for admission at the university at Vienna.

In all these schools excursions are made by the scholars under the guidance of the teachers, for the purpose of combining practical illustration with theoretical knowledge, in the branches of natural history, forest culture, preservation and valuation.

Examinations take place at the end of each semester (term).

Elementary (Niedere) Schools for Forest Culture.

The Ministry of Agriculture has established four of these lower schools, one in Tyrol, one in Styr, one in Galicia, and one in Agglsbach.

Course of Study:—Mathematics, geometrical exercises, field engineering, measuring of wood and timber cut and standing, measuring of arth and excavations, writing, drawing, natural history, geology, mineralogy, zoology, game as distinguished from other animals.

Practical Works:—Felling timber—numbering, measuring and piling same, planting and replanting forests, draining and irrigation, protection against insects and fires, charcoal making, sawing lumber and hunting.

The scholars are also required to construe and explain the most important provisions of the forest laws and to commit them to memory.

They are also taught the use, value, etc., of all building material, viz., wood, lime, bricks, stone, sand, etc., and are instructed in the building and clearing of forest roads, and the securing of the banks of forest streams, and repairing fissures in same, etc.

As teachers in these elementary schools experienced forest officers are detailed.

The discipline in these schools as regards the conduct and studies of the scholars, as well in school as in chambers, is very strict.

No scholar is permitted to absent himself from the institution without leave the side arms and guns intrusted to the scholars for practise, must be cleaned in the presence of the teachers and delivered to their care; all tools used by them must be cared for in the same manner.

If an offence against the regulations is repeated three times, dismissal follows.

Strict moral conduct is enforced, and the scholars are continually under the direct control and supervision of one of the teachers, who is also charged with the duty of visiting the scholars in their rooms.

All moneys belonging to the scholars must be deposited with the teachers, who supply the depositors with the amount actually needed from the deposit funds, and the parents are advised of this regulation.

The regulations of discipline are too voluminous to be cited here in full. They also differ somewhat in the different schools, but on the whole they are framed in a strict military spirit, which looks upon obedience to rules of conduct as a first requisite to a successful course of study.

A young man who has graduated from an elementary to a middle forest school, and from that to the university, or high school of forest culture, who has obtained his diploma at the latter, and has also passed the two State examinations, may be said to be thoroughly fitted for his profession, and besides undoubtedly clean, healthy, robust, and thoroughly manly in a physical as well as in a moral sense.

Extracts from General Forest Law of Austria in Force since January 1, 1853.

Cultivation of Forests.

Sec. 1. Forests are distinguished as (*a*) State or Imperial forests under the control of the State authorities. (*b*) Common forests, belonging to the city and country communities. (*c*) Private forests, belonging either to private individuals, or to corporations, or to orders, monasteries, benefices or prebends.

Sec. 2. No forest can be withdrawn from cultivation and used for other purposes except by consent. This consent can only be granted with reference to State forests by the proper authority, and if questions of strategy or military defence arise the concurrence of the Ministry of war is required.

With reference to common and private forests the consent of the district authorities is required, and all parties interested are to be heard on the application, and in case of conflict of interests the matter is to be submitted to the proper civil judge.

The arbitrary use of forests for other purposes is punished by a five of five florins per joch. (1 joch equals 1.42 acres).

The area thus converted to improper use must be replanted within a certain time, to be fixed by experts. In case of default the fine is again imposed.

Sec. 3. Newly-cleared tracts of State or common forests must be replanted within five years. A longer time may be allowed for the replanting of private forests, according to circumstances, and in pursuance of the provisions of section 20.

Sec. 4. No forest should be devastated; that is, so treated that the cultivation is either jeopardized or made impossible. If the cultivation has only been jeopardized a fine will be imposed in accordance with section 2, and the replanting is to be enforced. If, however, cultivation has been impossible, a fine up to ten florins per joch will be imposed.

Sec. 5. A cultivation which exposes neighboring forests to injury from winds is prohibited. A strip of woods at least twenty Vienna klafter wide must be left, when such danger exists, along the margin of the neighboring woods until the same is in full growth. In the meantime this wind-cloak can only be thinned.

Sec. 6. On sandy soil and on steep mountain slopes the timber can only be cut in narrow strips or thinned out, and must be immediately replaced. The woods upon the summits of mountains must only be thinned.

Sec. 7. On the shores of large rivers or lakes, if the shores are not composed of rocks, and on the slopes of mountains where land slides are possible great care is to be exercised, and roots can only be dug if the fissure is immediately repaired.

Sec. 8. Violations of sections 5, 6 and 7, are punished with a fine of from 20 to 200 florins. Damage accruing to others to be paid by offender.

Sec. 9. Provides for cultivation of common forests, and for limitation and official control of grazing and other privileges and uses.

Sec. 10. Grazing is not permitted in young timber, where it might injure the growth, and no more cattle are to be driven into any woods than can find sufficient food within the area. Herdsmen must be employed, and the cattle shall graze together, and not isolated, as much as possible. The driving of cattle to the place of grazing to be done with due regard to the preservation of the forest; if necessary a circuitous route is to be taken.

Sec. 11. Bedding of dry leaves and moss must be gathered only with wooden rakes, without scratching up the soil. In young timber no gathering of bedding is permitted.

Sec. 12. From felled trees all the branches may be cut; from standing trees, selected for future cutting, the lower two-thirds of branches may be cut. The young shoots between the strong branches must be preserved. From trees which are not to be felled immediately the branches must be cut between the months of August and March, excepting only during severe frost. No climbing vines are permitted.

Sec. 13. The gathering of bedding can only be permitted on the same ground every third year. Young shoots, may, however, be gathered with permission of owner.

Sec. 14. Provides for regulating the exact time within which parties possessing the privilege may gather bedding. Time to be fixed by the owner.

Sec. 15. Provides for the different marks on timber to be felled.

Sect. 16. Where the preservation of young timber requires it the cutting and transporting of timber must take place in the fall or in winter during snow fall. Generally timber may be cut also in spring or summer, but in such case it must be taken out of the woods before the next ensuing spring.

From trees felled in the green leaf the bark is to be peeled at once; from these felled in the late fall the bark must be taken in strips before the next spring. The stumps must not be left too high. In felling trees, hewing and transporting timber, all injury to standing trees is to be avoided. The same rule obtains with reference to the gathering and transportation of bedding, which must be removed out of the woods within three months.

Sec. 17. All products of the woods must be removed on the road designated by the owner. The time of removal as agreed between owner and purchaser of timber to be requested; if not so requested owner may give fourteen days' notice and dispose of products if notice is not complied with.

Sec. 18. Provides that forest officials (political authorities) shall decide all differences and disputes. Owners of forests who violate regulations to be fined for each offence from 20 to 200 florins.

Sec. 19. Provides that the State, in case of necessity, can take possession of forests for the purpose of protection against avalanches, land slides, etc. If claims for damages arise they are to be settled according to law.

Sec. 20. Provides manner of proceeding for the purpose of taking such possession, examination of experts, etc.

Sec. 21. As a rule no partition of common forests can be made.

Sec. 22. For the purpose of insuring the proper cultivation of forests all owners of forests of sufficient dimensions (which dimensions are prescribed by the authorities) are required to employ only such forests officers as are considered qualified by the government.

Sec. 23. The political authorities are charged with the general superintendence of all forests in their respective districts.

Transportation of Forest Products.

Every land owner is required to permit forest products to be transported across his land if no other outlet is convenient, or if other transportation is too expensive.

The transportation must be conducted with proper care, and all damages accruing must be paid.

The political authorities decide whether such transportation across lands of third parties is necessary and also fix amount of damages, from which decision as to damages an appeal may be taken to the courts.

Sec. 25. Provides for jurisdiction with reference to transportation over public roads, etc.

Sec. 26. The transportation of wood by means of rafts and the building of booms require special permission by the authorities of the district. If the use of private waters is required proceedings must be had according to section 24.

Secs. 27 to 43. Refer to the regulation of rafting, marking of timber transported by rafts, use of rivers and other waters, public and private, for rafting, etc.

Forest Fires and Damages by Insects.

Sec. 44. The greatest care must be exercised in igniting fires or in using combustible materials in or near the forests. If dangers arise in consequence of neglect to use such care the offenders must pay all damages, and may according to circumstances, be either prosecuted under the general criminal code or fined from 5 to 40 florins, or imprisoned from one to eight days.

Sec. 45. Every person who finds a deserted and unextinguished fire in or on the edge of a forest is required to extinguish it if possible. If any person observes a forest fire he is held to give notice to the next inhabitants in the direction of the road which he travels. These parties so notified are required to give notice to the nearest local authorities and to the owner of the forest or to his forest officials.

Sec. 46. All surrounding villages can be required by the owner of the forest, or his forest officials, or by the local authorities to extinguish the fire. The posse must at once repair to the place of the fire with the necessary fire-extinguishing apparatus. The local authorities and the forest officials must accompany the posse.

Sec. 47. Unconditional obedience is to be paid to the superior officer commanding the posse The other local officials must preserve order among the firemen and cause the execution of the orders. After the fire has been extinguished the place where it occurred is to be guarded from one to two days, or longer, if necessary, and the necessary number of men must be furnished for this purpose.

Sec. 48. Local officers who neglect to perform their duty will be fined from 5 to 50 florins, and all persons who refuse to obey their orders will be punished by a fine of from 5 to 15 florins or by imprisonment from 1 to 3 days.

Sec. 49. Damages to property of third parties, caused by extinguishing these fires, are to be paid by the parties for whose benefit the posse was called, unless this third party was protected against still greater loss by the efforts of the posse.

Sec. 50. The damages caused to forests by insects are to be closely watched. The owners of forests and their employees are required, in case they cannot succeed in preventing the spread of such damage to adjacent woods, or on their own grounds, to notify the political authorities at once, or in default thereof to pay a fine of from 5 to 50 florins. Every person is authorized to give such notice.

Sec. 51. The political authorities, with the assistance of experts, must at once take the proper measures to prevent this damage by insects. All owners of forests whose woods may be in danger are bound to render assistance and to submit to the order of the authorities, who are herewith authorized to enforce their orders.

The expense shall be borne by the owners of the forests in proportion to the dimensions of their respective tracts.

Forest Preservation Service.

Sec. 52. Provides for the organization of forest guards to be attached to the forest administration service. These guards, whether employed by the State, by communities, or by private individuals, to take the oath of office. (Form of oath general, with reference to performance of duties in preserving forests as law requires).

Sec. 53. These sworn guards to be regarded as public guards, with all rights guaranteed to public officers by law, and authorized to carry the usual arms. Every persons is required to obey their orders given in the line of their duties.

Sec. 54. The guards shall use their arms only in case of self-defence. To wear uniforms.

Sec. 55. The guards are authorized to order suspicious persons to leave the forests and to confiscate all tools used for gathering forest products if the parties carrying them in the forest cannot give a satisfactory explanation.

Sec. 56. Confiscation of forest products in possession of suspicious party in the forest.

Sec. 57. Offender who are strangers to the guards are to be arrested ; offenders known to the guard are to be arrested only in case they attack or abuse him, or if they have no fixed home. Persons arrested to be delivered at once to the competent authorities.

Sec. 58. In case the offender was caught in the act and took flight he may be pursued beyond the forest and the stolen product attached.

Miscellaneous.

Chapter five contains an enumeration of minor forests offences not hereinbefore particularly mentioned, and fixes the punishment.

These offences are : Gathering of loose wood and twigs, marking and barking of trees, using climbing irons, boring into trees, appropriating bark from felled timber, exposing the roots of trees, cutting or tearing off limbs or twigs or leaves, digging or cutting out young trees, grathering twigs for brooms, gathering tree juice of all sorts, gathering tree seeds or sponges or rotten wood or digging out roots, gathering bedding of all sorts, especially if gathered with hoes or iron rakes ; taking away earth, clay, turf, stones, and other minerals, or cutting sod, or mowing grass and herbs.

This chapter also provides for proceedings and estimate for damages to forests by cattle. Chapter six provides for mode of procedure and proper tribunal to fix damages. Chapter seven provides for proceedings on appeal.

KINGDOM OF PRUSSIA; REPORT OF CONSUL WAMER OF COLOGNE.

Forest Area in the Prussian Monarchy.

The total area of the Prussian Monarchy amounts to 35,479,536 hectares.* Of this amount 8,124,521 hectares are forests, being an equivalent of 23.33 per cent. of the total area. It may be stated that this estimate includes all land devoted to the culture of wood.

The apportionment of the forests is as follows:—

(*a*) 29.4 per cent., equivalent to 2,374,039 hectares belong to the State.

(*b*) 11.9 per cent., equivalent to 983,727 hectares belong to the Communes.

(*c*) 1.5 per cent., equivalent to 122,759 hectares belong to institutions.

(*d*) 2.1 per cent., equivalent to 170,063 hectares belong to corporations.

(*e*) 55.1 per cent., equivalent to 4,473,933 hectares belong to private individuals.

Under the same heads the Rhenish Province and the district of Cologne have the following area respectively:—

Rhenish Province.	Hectares.	Cologne.	Hectares.
(a)	143,284	(a)	11,766
(b)	321,019	(b)	7,358
(c)	7,149	(c)	1,773
(d)	15,303	(d)	1,201
(e)	342,687	(e)	98,284

The forests of Prussia stretch from the Baltic coast over the mountains of the Sudeten, Hartz, Thuringia, Teutoburg, Meissner, Taunus, Rhön, and the slate mountains of the Lower Rhine.

According to a rough estimate, 4,043,800 hectares of forest area are level, 2,089,500 hectares are hilly, and 1,991,200 hectares are mountainous.

Government Supervision Over Communal Forests.

Although the Communes are left free to manage the Communal forests, the State government reserves for itself certain rights over the general administration in order to prevent any mismanagement or abuses. For instance, in Westphalia and the Rhineland, which embrace this consular district, the communities and public institutions are left free to administer their own forests, but at the same time the government gives certain instructions regarding the culture and utilization of the forests, which, the local authorities are bound to carry out without any alteration on their part not first consented to by the government. Whether it is considered best that the Commune should appoint the officials intrusted with the supervision of the forest is left to the discretion of the government. In leaving the election of the forest officials to the Communes, they are to elect

*Consul Wamer says:—Considering the vast amount of technical knowledge required to fully comprehend the whole system of forest culture in Prussia, I have found it extremely difficult in preparing a report on this subject, and I am greatly indebted to *Oberforstmeister* (head forest master) von Wurmb, chief of the forest department of the Government district of Cologne for such information.

One hectare is equivalent to 2.471 acres.

The total area of forest in the Empire of Germany is 13,900,611 hectares, or 25 per cent. of the total land area.

such persons whose qualifications are approved by the government, to whom the election is submitted for consideration and confirmation. It is the duty of the government, either by virtue of its office or for some special reason, to examine into any changes made in the management of the Communal forest, and to proceed against all adverse administration by assuming special supervision or by instituting any other judicious precaution.

As technical organs for the supervision of the Communal forests, the government can make use of its foresters, who are generally bound to report to government any wrong done to the Communal forests that may come to their knowledge. The technical supervision is conducted by its technical foresters, namely, by the *oberforstbeamte* (head forest officers), and *forstmeister* (forest master).

Each *forstmeister* has a special geographical district allotted to him, who has not only to superintend the State forests, but also, at the request of the government department of the interior, of which he is a technical member, to examine the management of all the Communal forests situated within his particular district. The *oberforstbeamte* (head forest officer), has general supervision over the administration of all the Communal forests situated within the government district of which he is the head, and by whom all orders are issued. The privileges of the Communes in their forests consist in their having sole benefit of all the income or any other profit derived from the forests. The use of the pastures, as well as the straw and grazing, is usually permitted to the consumers whenever such use is very necessary, but is so far restricted that the condition and value of the forests and the maintenance of the pastures may not suffer thereby. The Communes are bound to bring all sand dunes and waste lands under forest cultivation as soon as it is shown it can be profitably done. On all sales of Communal forest area the permission of the Government must first be obtained.

Organization and Functions of Government Forest Bureaus.

The State forest administration is under the Ministry for Agriculture, Domain, and Forest. The chief direction of forest affairs is divided into four heads:—

1. The central direction: Forest Department in the Ministry for Agriculture, Domain, and Forests.

2. Local direction: Inspection and control by the district government under the Department of Taxes, Domain, and Forest.

3. District administration by the chief forester (*oberforster*), respectively the Bureau of Receipts and Disbursements.

4. Forest preservation and special superintendents over the management of the subordinate foresters (the so-called *forstschutzbeamten*).

The revision of all forest accounts is done at the so-called *Ober-Rechnungskammer* (Head Bureau of Accounts) of the Ministerial Department. The entire organization is based upon the division of the State forests into so-called *oberforstereien* (forest districts). Every principal forest district is an independent administration, for whose administration a separate finance is kept, and the chief forester, who is the responsible administrator of the finance, submits all the accounts through the forest treasurer of his district to the Finance Department of the government, for auditing.

The duty of the *oberforster* (head forester) is to watch and take care of the preservation of his forest district and to make his administration useful in every

possible way. It is, therefore, the duty of the *oberforster* to possess the most exact knowledge of the working of the district confided to his care, and not to neglect visiting the forest daily, if possible.

The *oberforster* is an independent officer, and is alone responsible for the duties and salaries of his assistants.

The *oberforster*, on having passed the scientific examination required by the State, is appointed by the Minister of Agriculture, Domain, and Forest, and receives a definite salary, with the right of pension. His rank is that of a government assessor. The extent of each forest district varies. There are 679 forest districts in Prussia, and the average size of each district is 3,496 hectares.

The following table shows the area of State forests in the different Provinces, also the number and the average size of each *oberforsterei* :—

Province.	Forest area.	Oberforsterei.	Average size of oberforsterei.
	Hectares.	Number.	Hectares.
East Prussia	359,241	74	4,855
West Prussia	273,174	47	5,812
Brandenberg	369,510	72	5,132
Pomerania	170,619	42	4,062
Posen	162,029	28	5,787
Silesia	151,325	34	4,451
Saxony	169,480	55	3,081
Schleswig	30,111	16	1,882
Hanover	235,074	104	2,260
Westphalia	57,189	19	3,009
Hessen-Nassau	253,003	146	1,733
Rhine Province	143,284	42	3,412
Total	2,374,039	679	45,476

There is a treasurer for each *oberforsterei*. He is an independent officer and is alone responsible for the administration of his bureau. The government appoints him, and he is required to give bond for the faithful discharge of his duties.

The foresters under the supervision of the chief forester (*oberforster*), are of two classes, namely, those who protect and attend to the practical management of the forests, the so-called *forsters* (foresters), and *waldwarter* (forest attendant), and the assistant foresters, the so-called *forsthulfsaufscher*. The immediate head of the chief forester is the district government, especially its department of finance, and whose organs for the administration and supervision of the forests and the finances are in the person of the *forstmeister* (forest master), and *oberforstmeister* (head forest master). The former has control over a certain number of the chief forests within the government district, and the latter over all in the government district.

The *forstmeister* resides at the seat of the district government as a technical member of it. He has to personally inspect every part of the district at least three times a year, assist in carrying out the regulations of work and in adjusting the finance, in controlling and fixing the annual plans of culture and the felling of the forest, subject to the supervision of the *oberforstmeister*. Further, he has to examine all the work done in the forest and its protection, inspect the book of the *oberforster*, and the accounts of the treasurer, check the forest cash account and the inventories, and inspect once in every five years all the forest boundaries of every forest district within his district and report as to their condition. As a member of the district government he has to work out all business matters which directly concern his inspection district, except in cases where the work is specially provided for. All reports of the *oberforster* to the government must be sent through the hands of the *forstmeister*.

The *forstmeisters* are appointed by His Majesty the Emperor and King, on the proposal of the Minister for Agriculture, Domain, and Forest, of the *oberforsters* who have distinguished themselves by their superior technical education and business management of forests. They have not to pass any special examination for this promotion beyond the forest scientific examination originally passed and required by the government for *oberforsters*.

Forstmeisters rank as *regierungs rathe* (government councillors). The number of *forstmeisters* at present in Prussia is 92, which is on an average of about 6 to 7 *oberforstereien* (chief forest districts) to each *forstmeister*. This estimate, however, does not include the communal forests of Westphalia and the Rhineland nor the 80 royal *oberforstersien* under the supervision of 26 *oberforstmeisters* who are the directors of the whole administration of the entire government district, and, as such, are the superior officers of the *forstmeister*.

Accordingly, there is one *oberforstmeister* for each government district, who is, by virtue of his office, a member of its department. The *oberforstmeister* is selected out of a number of the most capable *forstmeisters*, who is proposed by the Minister for Agriculture, Domain and Forest, with the sanction of the State Ministry, and appointed by His Majesty, the Emperor and King. The *oberforstmeister*, having the entire forest administration of the government district, has to make annually, in conjunction with the *forstmeister*, an inspection tour and to see that the management of the forest is properly carried out. He has, under the direction of the government district president the appointment and arrangement of the pay of the forest police according to the general instructions issued by the Minister. He has, further, the regulating of the general business, the preparing of the budget, the super-revision and approval of the annual felling and cultivation plans, the distribution of the means for the cultivation of the forests, and the disposition of the funds set apart for the entire district.

The Ministry for Agriculture, Domain and Forest contains in its department for forest the central direction for the entire state forest administration, consisting of an *oberland-forstmeister* (head State forester) a ministerial director and four forest technical ministerial councillors, whose departments of business are arranged according to the Province. The general regulations for the maintenance and utilization of the State property, consisting in forests, are fixed by the Minister, who also takes care that they are properly executed.

REVENUES FROM GOVERNMENT FORESTS; COST OF MAINTAINING OR MANAGING FORESTS; PROFITS OF FOREST CULTIVATION.

The estimated revenue and expenditure of the State forests for the years 1886-87, according to official statement, are given as follows:

Gross receipts	M.	56,070,000
Ordinary expenses	M.	31,062,200
Surplus	M.	25,007,800
Extraordinary expenses		2,450,000
Net income	M.	22,557,800

FOREST SCHOOLS.

In Prussia there exist three kinds of forest schools.

(*a*) Two preparatory forest schools for *forster* and *forstschutzbeamte*. The pupils, from 12 to 17 years of age, receive at these schools an elementary education and practical instruction in forestry under the direction of a *forster*. These schools are intended to take the place of the apprenticeship of two or three years which the student, on the completion of his elementary education elsewhere, would otherwise be obliged to serve at an *oberforsterei* under the direction of the *oberforster*. The advantage of the former is that it combines the elementary education with practical forest instruction.

(*b*) Two forest academies, one at *Eberwalde* and the other at Minden, under the department of the Minister for Agriculture, Domain and Forest, and the immediate supervision of the *oberlandforstmeister*, one of the chief state forest officials in the Forest Department of the Ministry. These academies are intended to give a scientific education and to fit students for the forest administration service, that is to say, for the higher forest career, from *oberforster* upward.

The term of study is two years and embraces the following branches:

A. Fundamental Science

1. Physics, including meteorology and mechanics.
2. Chemistry, organic and inorganic.
3. Mineralogy.
4. Geognosy and geology.
5. Botany.
   (*a*) General botany.
   (*b*) Anatomy, physiology and pathology of plants.
   (*c*) Special forest botany.
   (*d*) Anatomical and miscropical demonstration.
6. Zoology.
   (*a*) General zoology.
   (*b*) Special zoology particularly with respect to the different kinds of forest animals and birds.

7. Mathematics.

(*a*) Repertory and practice in arithmetic, planimetry, trigonometry and stereometry.

(*b*) Principles of analytical geometry.

(*c*) Principles of high analyses.

8. General political economy, particularly with respect to forest affairs.

B. Branch Science.

1. History and literature of forest affairs.
2. Forest statics.
3. Forest planting.
4. Forest preservation.
5. Forest technology.
6. Forest valuation, wood measuring, forest survey.
7. Forest statistics.
8. Forest administration, particularly with respect to the organization of forest affairs in Prussia.
9. Forest administration.
10. Redemption of forest claims.

C. Adjunct Science.

1. Jurisprudence, Prussian civil and penal code.
2. Forest road construction.
3. Game law.

As aids to study, these academies have extensive collections relating to forest and natural science, botanical gardens, seed collections, etc. Each academy is under the direction of an *oberforstmeister*. The lectures are given by scientifically educated foresters and special professors. The student, before he is admitted to these academies, must produce a diploma showing that he has passed the course of studies required at a German gymnasium or at a Prussian technical school of the first class. He must be under 25 years of age, have a good character and show that he possesses the necessary means for studying.

Effects of Forest Destruction.

The destruction of forests is caused mostly by parcelling off large forest estates, which leads to a careless felling of the trees and little disposition to restore the loss. An eminent authority on forestry science, Dr. Otto von Hagen, in writing on this subject makes the following observations:

"The forest is a trust handed down to us from past ages, whose value consists not alone in the income derived from wood, but also in the importance which it exerts, through its influence on climate and rainfall, on land culture. Its importance is not merely a question of the present day or of the present ownership, but is also a matter which concerns the future welfare of the people. This is a truism beyond contradiction, but nevertheless it is daily disregarded by those who are indolent and selfish.

"When such evils reach the stage of common danger, and this is in a great measure already the case, it then becomes a duty to interfere by legislation. Neither the decrease of the wood production nor the difficulty at times to meet the demand for wood, nor the rise in the price can confer upon the State the right to interfere with the freedom of private ownership or of private administration of forests, but this right and duty would devolve upon the State in case that any injury is done to the welfare and existence of the inhabitants of a certain locality resulting from the destruction of the forest. How entire districts which flourished in the past have been reduced to poverty and want through forest destruction, has been seen in Prussia, where large tracts of lands have suffered under such calamities.

"By stripping the beeches of their forests in the seventeenth and eighteenth centuries, the sea coasts have become exposed to all winds and storms. Fields, once fertile, have been transformed into waste sand dunes, and whole villages, whose agricultural people formerly prospered, have ceased to exist.

"In the middle and eastern Provinces light and undulating soil has been replaced by small or large sand hills, and places where forests once stood and served to carry off stagnant moisture, have been turned into marshes. In the western mountainous Provinces the fertile forest soil, the waste product of thousands of years of the trees, has disappeared. It has been dried up by the sun and wind, and washed into the valleys by rain and snow-water, and left the mountains bare and unfertile, whose soil is scarcely capable of supporting any vegetation save heath and broom-grass.

"The rich meadows in the valleys have vanished, they have been again and again, after every rainstorm, washed and torn by the water rushing from the mountain tops. The high moors which have been formed by the destruction of the forest, emit at all times of the year vapors and fogs which kill vegetation far into the land. Thus the soil becomes directly impoverished, and the climatic conditions change and become worse. Instances of the injurious effect upon the culture of the soil caused by the destruction of the forests can be seen to a smaller or larger extent throughout Prussia."

A Brief Retrospect.

Early in the fourteenth century, in the more thickly populated sections of Switzerland, the people appear to have been forced, through apprehension of a deficiency in their wood supply, to take some measures for the preservation of their forests. In the year 1314 Zurich forbade its foresters (vorsters) to "fell, raft or sell wood from the Sihlwald." In 1339 Schwyz issued a prohibition against charcoal burning, and in 1438 Freiburg decreed that no wood should be cut in the environs of the city. In Entlebuch it was forbidden in 1471 "to draw wood from forests situated high up in the mountains," and in 1592 Berne called attention to the need of economy in the use of wood. Finally similar decrees became general, but while serving to preserve forest areas they proved a hindrance to the progress of agricultural and vine-growing interests. Zurich, for instance, in 1563, forbade the establishment of any new vineyards, and the prohibition was kept in force up to the beginning of the eighteenth century. At that period the dread of a deficiency of wood became so general that it was even forbidden to purvey or export any of it from one village to another. Contemporaneously with these prohibitions were issued others forbidding the pasturage of cattle, sheep and goats in the forests. The old law generally ran in some such homely text as this: Whoever keeps a cow at home in summer is allowed to drive no goats, and nobody more than he actually requires for his house-keeping.

But spite of all these precautions and prohibitive measures the lack of combined action became painfully apparent. Moreover the individual owners were refractory, resented interference, and held on to their woodlands, so that, in fact, to-day the comparatively small forest area belonging to the State is what has principally been acquired by direct purchase, by inheritance or by the suppression of monasteries, as in the Bernese Jura, in Thurgau and in Schaffhausen.

With the advent, however, of the eighteenth century, Swiss forestry took on, in an official sense at least, a more active existence.

In 1702 Zurich, always foremost in the work, appointed a commission to devise a general forestry system. In 1825 Berne fcllowed suit, and later Freiburg, Lucerne and Schwyz took action in the same direction. From this time on the several cantons managed their own forestry matters as they wished, and entirely independent of each other up to ten years ago, when the imperative needs of combined action having become apparent the matter was taken in hand by the federal authorities, whose attention had been called to the pressing demand for a legislative action to arrest the destruction of forests especially in the higher mountain regions. Accordingly on the 24th of March, 1876, a law was passed establishing federal control over the forests in all the mountain regions of Switzerland, embracing eight entire cantons, viz., Appenzell, Glarus Graubunden, Schwyz, Tessin, Unterwalden, Uri and Valais, and parts of seven others, viz., Berne, 41.48 per cent.; Freiburg, 32.70 per cent; Lucerne 53.50 per cent; St. Gallen, 76.17 per cent; Waadt, 22.98 per cent; Zug, — — per cent; Zurich, 6.86 per cent.

Zurich Forest System.

As will be observed from the foregoing, Zurich has always evinced an actual and especial interest in forestry matters, and the result is that her forestry system at the present day is a model one, and is so regarded throughout Switzerland. Her forestry law, which has been in operation in its present form for over a quarter of a century, is so complete in every detail as to form a report in itself and it is therefore translated and incorporated in full herewith.

1. Organization.

1. Cantonal, township, and corporation forests shall be subject to the control of the government forestry system. Private forests come under the same provision, in so far as the safety of the others or regard for a common danger renders necessary.

2. According to article 49 of the law pertaining to the organization of the government council, supreme control of the forestry system is vested in the direction of the interior. A yearly sum of 8,000 francs will be allowed it for the cost of management, and for the interests of forest culture, as, for instance, in the award of premiums for distinguished services, establishment of a course of instruction for foresters etc.

3. The canton is divided into four forestry districts, the limits of which shall be fixed by the council.

4. The cantonal forestry board shall consist of one overforest master and four district forest masters. The council is authorized to furnish an adjunct thereto. In said board is vested the duty of superintending all forestry affairs. The maintenance of the cantonal forest under control of the director of finance is also transferred to it; the duties of its members will be especially determined by official instructions from the council.

5. Only those who shall have passed a government examination, as prescribed by the council, and have been declared competent by the direction of the interior, shall be employed as forestry officials.

6, The overforest master, the district forest masters and the adjunct, shall be chosen by the council on the simple, though not binding, nomination of the direction of the interior.

The term of service of the over and district forest masters shall be for three years. The adjunct shall be chosen for a period to be fixed by the council. Retiring officers are eligible for re-election.

7. The overforest master receives a salary of 3,500 francs. When travelling on official business, his cash outlays will be reimbursed. The further sum of 1,000 francs is allowed for clerk and office expenses.

8. District forest masters receive an annual salary of 2,200 francs. While on official journeys on forest service, they receive a daily allowance of 10 francs, and while on official journeys, in the interest of cantonal forests, a daily allowance to be determined by the council.

9. The council shall fix the sum to be paid to the adjunct out of the appropriation provided in article 2.

10. The daily allowances, when involving cash outlays, shall be paid from the cantonal forestry fund, or from the appropriation provided in article 2, depending on whether they concern business connected with the cantonal or non-cantonal forests.

11. Forestry officials are required to give bonds in the amounts to be determined by the council.

12. Each corporation shall elect a board of overseers of not less than three members, for a period of three years, and shall give notice of such election to the directors of the interior.

13. The employment of foresters is obligatory upon (*a*) the canton for all forests directly or indirectly belonging to it, (*b*) all forest-owning townships, and (*c*) wood corporations. Townships and corporations are directed to appoint an overforester. Several townships or corporations may unite on one and the same person for this purpose. Forestry officials appointed by townships and corporations, are, at the same time, subordinate to the cantonal forestry officials in matters pertaining to cantonal forests.

14. Townships, corporations, and private owners are to pay the salaries of forestry officers appointed by them. Where the forests of a township or corporation are so small that such salary does not amount to 100 francs, then the township or corporation in question shall unite with one or several neighboring townships or corporations to appoint a forester in common. The proper method of procedure in such cases shall be determined by the direction of the interior.

15. Cantonal foresters shall be chosen by the direction of finance on the simple, though not binding, nomination of the overforest master. The choice of township and corporation overforesters and foresters is vested in the board of overseers, which may, for this purpose, be increased to six or eight members. The term of service for overforesters and foresters shall be three years. Elections shall always be held after the renewal of the board of overseers. Retiring members are eligible for re-election. This period of service takes effect in individual cases from the first election held after the promulgation of this law.

16. The providing of foresters for private forests is left to the owners. But, in case a forest district is adjacent, the owner may decide upon the appointment

of a forester and be present at his election, at which the minority must submit and assume its proportional share of the salary. The proportional voice in voting, as well as in paying, shall be determined on a ratio of the area represented. Private individuals may, with the consent of the township or corporations, transfer to the latter's foresters the care of their forests, in which case they shall arrange with said township or corporation for what they are to pay.

17. Applicants for the position of overforester must furnish proof of their competency in the form of an essay to be submitted to the overforest master. Special instructions as to the nature of such essay will be furnished in an order from the direction of the interior. As conditions of eligibility as forester, active citizenship, a good physical constitution, and a knowledge of reading, writing, and arithmetic will be required.

18. Elections of overforesters and foresters by boards of overseers of townships and corporations, are subject to examination and confirmation by the direction of the interior. To this end, certificates, stating the manner of election, name, age, and former employment of the candidate, and the annual salary pertaining to the position, shall be forwarded, through the Statthalter's offices, to the direction of the the interior. The examination by the latter covers in part the validity of the election, and in part the existence of the lawful qualifications, and it is ordered that confirmation be withheld where a candidate has previously been convicted of serious violations of, or misdemeanors against, forestry regulations. After confirmation, the newly-elected candidate is ordered to be sworn (oaths are no longer administered, the "hand vow," as it is called, having been substituted), which duty is to be performed by the Statthalter's office. Private owners appointing foresters must have them sworn by the Statthalter's office.

19. Sworn forestry employees stand, in regard to the performance of police duties, on an equal footing with police employees. The same official credit is, consequently, to be accorded to their reports, made under the provisions of article 96 and the following article of this law, as would be accorded to the same, if made by the police officers.

20. It shall be the duty of foresters in the cantonal, township and corporation forests to attend a course of instruction on the subject of forestry, to be provided by the direction of the interior, and imparted by the forest masters. They may be required by the direction of the interior to attend a second course, when a previous examination shall have proved unsatisfactory. They receive their service instructions from the direction of the interior. Foresters in private forests shall be allowed to participate in the courses of instruction referred to.

21. The consent of the direction of the interior is necessary whenever the overforest master, forest masters, or foresters, in cantonal forests desire to fill any other official position, or follow any other pursuit in conjunction with their position as stated. Overforesters, and foresters in township and corporation forests, cannot at the same time be members of their election boards. Before entering upon any other township office or service, they must procure the consent of the direction of the interior.

22. The following of any business in wood, or manufactured wooden-ware, or of any industry in which wood is the leading material, is unconditionally forbidden for all persons in the cantonal, township and corporation forestry service

FORESTRY IN FRANCE.*

The Woods and Forests of France.

In 1876, the last year for which anything like complete details are available, the total wooded area of France, exclusive of isolated trees, such as those growing in parks and on road-sides, which were not planted for the sake of the timber they produce, amounted to 35,464 square miles, or a little more than 17 per cent. of the entire area of the country. The proportion in other European countries is as follows, viz.:—

	Per cent.
Russia	40
Sweden	34
Norway	29½
Germany	26
Turkey	22
Switzerland	18
Greece	14
Spain, Belgium, and Holland, each	7
Portugal	5
The British Isles	4
Denmark	3½

The average of all European States taken together, is 29½ per cent. The population of France being 181 per square mile, it follows that the area area of woodland per head is about three-fifths of an acre.

Some changes, which will be noted in a subsequent chapter, have taken place in the area of the State forests since 1876, but in that year the woods and forests were owned in the following proportions by the different classes of proprietors, viz.:—

	Square miles.	Per cent
The State	3,734	10.7
Communes and sections of communes	7,949	22.4
Public institutions	124	0.3
Private proprietors	23,657	66.6
Total	35,464	100.

and these figures may be taken as fairly representing the actual position at the present time.

Forests are not so exhausting to the soil as agricultural crops. In the case of the latter, the entire plant, except the roots, which are sometimes also taken, is removed, whereas with a crop of trees, the leaves, flowers and fruit, which are far richer in nutritive elements than the wood, are annually returned to the soil, and thus serve to maintain its productive power, as well as, by their protective action, to keep it in a good physical condition. Hence forests can flourish on comparatively poor soil; some kinds of trees, notably most of the conifers, being able to grow on ground that would be quite incapable of producing a series of

*By Major F. Bailey, R. E. Vol. XI. of the "Transactions of the Scottish Arboricultural Society."

remunerative agricultural crops; and it is, therefore, generally speaking, out of place to keep rich fertile valleys under forests, which ought rather to be maintained on ground which cannot be profitably cultivated. In well populated districts, matters naturally tend to settle themselves in this manner; the better classes of ground being brought under the plough, while every acre of the rest of the country is kept wooded, in order to meet the domestic and agricultural wants of a dense population. But it is otherwise in less favored localities. Here vast areas might be devoted to the production of wood; but while, from the nature of the case, the local consumption is, in such places, very small, the absence of communications frequently renders export very difficult. Hence wood has but a very small value, and the forests tend to disappear gradually before the excessive grazing to which they are subjected; for the population of such regions, being unable to make its living by agriculture, is, generally speaking, driven to adopt a pastoral life.

Forests grow in France at all altitudes up to about 9,000 to 9,500 feet above the sea, a much larger proportion of them being found at low than at high levels. Thus it has been calculated that, if the country were divided into altitude-zones of 200 meters each (656 feet), the lowest zone would contain 36 per cent. of the forests, while the highest would not contain more than .04 per cent. of them; the fifth zone (2,600 to 3,300 feet) would, however, on account of the extensive plateaus existing at this level, contain more than the fourth. Forests situated at high altitudes do not produce so much wood, and are, therefore, not so profitable as those grown lower down; consequently the private owners, who have done their best to preserve their woods in the plains and low hills have, in the majority of cases, allowed the mountain forests they once possessed to be destroyed by over grazing Hence it arises that, while at altitudes below 4,000 feet, the proportion of State and communal forests is comparatively small, hardly any private woods are found above the level of 6,000 feet, such forests as exist there being, generally speaking, maintained by the State or communes in the public interest, as a protection against avalanches and the formation of torrents. The private forests are then, taken as a whole, more favorably situated than those which belong to the State and the communes, both as regards soil, climate, means of export, and proximity to the markets. It has been calculated that the distribution of the forest area by zones of altitude is thus proportioned:—

Altitude.					Forests under the forest dept.		Private and communal forests not under the forest department.	Total.
					State.	Communal.		
	M.	M.	Ft.	Ft.	Per cent.	Per cent.	Per cent.	Per cent.
Plains	0 to 200 =		0 to	656	41	5	45	36
Low hills	200 to 500 =		656 to	1,640	32	48	25	31
Mountains above	500 = above		1,640		27	47	30	33
					100	100	100	100

It is said that if the trees could be grouped together, so as to form a series of pure forest, the proportion of the total area which would be occupied by each species would be as follows:—

	Per cent.
Oak (Q. sessiliflora and Q. pedunculata)	29
Beech	19
Hornbeam	12
Silver fir	7
Scotch pine	4½
Evergreen oak (Q. ilex)	4
Maritime pine	3
Spruce	3
Larch	2
Other kinds	16½
Total	100

The small number of species which enters to any important extent into the composition of the French forests is very remarkable. Thus it appears that oak, beech, and hornbeam occupy 60 per cent. of the tree covered area, more than one half of the remainder being taken up with six other species; but many other kinds are disseminated throughout the forests in various proportions according to circumstances. As a matter of course, however, the trees are not grouped together in the above manner, and, neglecting blanks, the crop on the ground is actually constituted somewhat as follows:—

	Per cent.	
Pure forests—		
Broad-leaved (oak or beech)	15	
Coniferous (silver fir, pine, spruce, or larch)	13	
		28
Mixed forests—		
Broad-leaved (oak, beech, and hornbeam)	52	
Broad-leaved and coniferous (beech and silver fir, or oak and pine)	18	
Coniferous (silver fir and spruce)	2	
		72
Total		100

Or separating the broad-leaved and the coniferous forests from those which consist of a mixture of the two, we have:—

	Per cent.
Broad-leaved forests, pure and mixed	67
Coniferous forests, pure and mixed	15
Broad-leaved and coniferous forest	18

The State forests show a smaller proportion of pure crops than are found in those of the communes, but they also comprise a very much larger proportion of forests in which the crop consists of a mixture of broad-leaved and coniferous species. The first of these differences is due to the circumstance that a mixture, which is always desirable from cultural considerations, has been systematically maintained in the State forests from a remote period, whereas this has not always been the case in the communes. The second difference is chiefly accounted for

by the fact that those parts of the State broad-leaved forests, where, from various causes, the soil has become much deteriorated, have frequently been planted up with conifers, which are the only kinds likely, on account of their capacity to grow on poor soil, to succeed under such conditions; but these are in such cases, only intended to act as nurses to broad-leaved species, which are subsequently to be raised under their shelter. But little work of this kind has yet been accomplished in the communal forests from want of the needful funds. The private forests resemble those of the communes rather than those which are State property but a further comparison in this respect between them and the other classes of forests need not be made at present.

Many circumstances combine together to influence the nature of the vegetable growth, which characterizes any particular locality.

Thus, a "limestone soil," which is one containing more than four or five per cent. of carbonate of lime, is usually marked by a rich and varied vegetation; while on a silicious soil the flora is much more simple and uniform, the undergrowth being often formed of bilberry (*Vaccinium myrtillus*), broom and heather. Forty-four per cent. of the French forests are on limestone. But the principal forest trees are not much affected by the chemical composition of the soil, the two deciduous oaks, the beech, the hornbeam, silver fir, spruce fir, the larch, being classed as "indifferent" to it The ever-green oak, however, shows a preference for limestone; and the Scotch pine flourishes best on a silicious soil; but the maritime pine will not grow on limestone. The climate, which varies with the latitude, altitude, amount and distribution of the rainfall, proximity, or otherwise of the sea, and other conditions, is the principal factor in determining the distribution of trees, each of which finds its home in the locality which best suits its temperament. The hot region of the south, the temperate regions of the north and centre, and the mountains, are each characterized by the spontaneous vegetation to which they are adapted. Thus, in the south, are found the evergreen oak and the maritime pine; while the spruce, the silver fir, and the larch inhabit the mountains; and the five other species mentioned, grow chiefly in the temperate regions. The physicial condition of the soil also exercies an important influence on the growth and local distribution of trees; for example, *Quercus pedunculata*, and the hornbeam, will grow on moist soil, which does not suit either *Quercus sessiliflora*, the beech or the evergreen oak.

During the entire course of their development, trees of all kinds require light; but during the early stages of their existence, some of them must be completely in the open, without any cover at all; while for others, various degrees of shade are necessary. This quality of the young plants is, generally speaking, in direct relation to the abundance of the foliage of the adult tree from which they spring.

Those which, when young, require much light, such as the larch, the pines and the oaks, are called the "robust," or trees of light cover, while others, which will not stand exposure such as the beech and silver fir, are called "delicate," or trees of heavy cover. The spruce and the hornbeam are classed intermediately between kinds of light and heavy cover. This is a very important question to the forester not only with reference to the method to be adopted for raising a crop of any particular kind of trees, but also with regard to their coppicing power, their effect on the soil, and other matters. Trees of light cover, generally speaking, coppice better than those of heavy cover, but the latter have a much greater effect than the former in improving the soil.

It is estimated that the 35,464 square miles of woods and forests yielded the following produce in 1876, viz., 17,896,227 loads (50 cubic feet) of wood of

all qualities, 321,741 tons weight of tanning bark, 2,556 tons weight of cork, and 31,539 tons weight of resin; the whole being valued at £9,471,017. The average production of wood was therefore 39 cubic feet per acre; and the gross revenue, omitting that on minor produce, which was very small, was equal to 8s. 4d. per acre.

But in addition to this, it is calculated that the isolated trees, not grown for the sake of their timber, and vines yield together three and one-half million loads per annum, valued at £1,000,000; so that the total production of wood in France is raised to about twenty-one and one-half million loads, and the value of the wood, bark, and resin to about £10,500,000. This gives the amount of wood and the money value of the forest produce per head of the population as 29½ cubic feet, and 5s. 9d. respectively.

Of the twenty-one and one-half million loads of wood produced, about four million loads were timber and the rest firewood. The latter sufficed for the national requirements, but the former was far from doing so; for the imports of wood of this class exceeded the exports by 2,062, 432 loads, valued at £6,408,000 —that is to say, that it was less than two-thirds of the amount required. The question of foreign timber supply is, therefore, a very important one, even for France, which has 17 per cent. of its area under forest.

FORESTS MANAGED BY THE STATE FOREST DEPARTMENT.

The forest law of 1827, which is still in force, confirmed the previous legislation, under which all woods and forests which form part of the domain of the State, all those which being the property of communes or sections, or of public institutions, are susceptible of being worked under a regular system, and finally all those in which the State, the communes, or public institutions possess a proprietary right jointly with private persons, are administered directly by the State Forest Department in accordance with the provisions of the forest law.

The areas thus administered at the commencement of 1885 were as follows, viz.,

	Hectares	Square miles
State forests	1,012,688	= 3,910
Communes, sections, and public institutions	1,967,846	= 7,598
Total	2,980,534	= 11,508

These figures, which include the dunes, represent about 5½ per cent. of the entire area of France, and nearly one-third of the total wooded area. An additional 144 square miles of barren land had, up to the end of 1884, been purchased by the State in connection with the project for the consolidation of bare and unstable slopes on the great mountain ranges; and this area is also administered by the department under the forest law. About 40 per cent. of the State forests are situated in the plains, while the rest of them, together with nearly the whole of the communal forests, are found in about equal proportions on low hills, up to an altitude of 1,700 feet, and on the higher mountain ranges. About one half of them stand on limestone rock, 92 per cent. of their entire area being actually under wood.

The principal object of the following pages is to sketch in a brief and summary manner the system of management adopted for these forests, so that some general idea may be formed of what the business of the French forest department consists in, and what the results of their labors have been, up to the latest date to which information is available under each head. The organization of the professional staff of the department, and the manner in which it is recruited, will then be explained

State Forests.

The forests now belonging to the State owe their origin to one or the other of the following sources:—They either formed part of the ancient royal domain, as it was consituted at the time of the ordinance of 1669, or of the sovereign domains united to France since that year; or else they were ecclesiastical property confiscated at the time of the revolution in 1790, or they have been more recently acquired by purchase, legacy or gift. About one-half of them are ancient roya domains.

The State forests were formerly of much greater extent then they are at present. In 1791 they covered an area of 18,166 square miles, which was reduced to 3,792 square miles in 1876, the reduction being almost solely due to sales effected for the benefit of the exchequer; but the loss of territorty after the war of 1870 was the cause of a diminution of 374 square miles. The records show that, between 1814 and 1870, 1,362 square miles of State forests were sold for nearly twelve and one-quarter million pounds sterling, or about £14 per acre; but since 1870 no such sales have taken place, and since 1876 the area has been somewhat increased by purchases and otherwise. It now includes 33 square miles of forest owned jointly with private persons, and 450 acres are temporarily held by the families of some of Napoleon I.'s generals, whose right will in the course of time either lapse or be commuted. The remainder of the area is owned absolutely by the State, but the enjoyment of the produce does not belong exclusively to the treasury, for, as will be explained hereafter, certain groups of rightholders participate in it.

In the next section, the principal points of laws relating to the communal forests, and of their management by the State Forest Department, will be brought to notice; while in the subsequent sections of this chapter the work of the department in connection with the State and the communal forests will be briefly treated of in such a manner as to bring out and compare the results obtained in the two classes of forests.

Forests Belonging to Communes, Sections and Public Institutions.

The territory of France is divided into 39,989 communes or village communities, of which about one-third are forest proprietors. Certain groups or sections of the inhabitants have, however, rights and own property, apart from the commune in which they reside, and these are also owners of considerable areas of woodland. Those forests belonging to communes or sections, which are susceptible of being worked on a regular system, are managed directly by the State Forest Department for the benefit of their owners, the principal features of this management being as follows, viz.: The laws relating to State forests are, generally speaking, but with certain exceptions, applicable to them; they cannot be alienated or cleared without the express and special sanction of the government in each case; they cannot be divided up among the members of the community; the annual sales of produce are effected by the State forest officers, and

the money realized is paid directly by the purchasers into the communal treasury; before the sale takes place the quantity of timber and firewood required by the inhabitants for their own use is made over to them usually standing in the forest, and it is subsequently worked out by a responsible contractor; three-quarters only of the total annual yield is available for distribution or sale, the remaining quarter being left to accumulate, and thus form a reserve fund or stock of timber from which exceptional necessities either in the way of wood or money can be met; the distribution of firewood is made according to the number of heads of families having a real and fixed domicile in the commune; the entry of goats into the forest is absolutely prohibited, while the grazing of sheep is only permitted temporarily, and under exceptional circumstances, with the special sanction of the government in each case; no grazing of any kind can be carried on in the forests, except in places declared out of danger by the forest officers who have the power to limit the extent to which it can be practiced with reference to the quantity of grass available; the forest guards are chosen by the communal authorities, subject to the approval of the forest officer, who delivers to them their warrants; the State defrays all expenses of management, including the officers' salaries, the marking of trees, notifying of sales, office charges, and the prosecution of offences; the State is reimbursed by the payment from the communal treasury of a sum equal to 5 per cent. on the sales of principal produce, including the value of the wood, made over to the inhabitants; but this payment, which forms a first charge on the forest revenue, can never exceed the rate of one franc per hectare (about four pence an acre) of the total area thus managed; the communes pay the guards' salaries, the taxes, and all charges for the maintenance and improvement of the forest, including planting, sowing, and road-making, as well as those for extraordinary works, such as demarcation, survey, and the preparation of working plans. In all this the forest officers are bound by law, to act on the principle that they are managing the property for the benefit of its owners, who must be consulted through their representatives, the mayor and municipal council, in all matters affecting their interests, and whose wishes must be acceded to when they are not opposed by the legislation, or contrary to the recognized principles of scientific forest management.

The principal public institutions are hospitals, charitable associations, churches, cathedral chapters, colleges, and schools; and the forests belonging to them are subject to administration by the State Forest Department on precisely the same terms as are those of the commune and sections.

Of the area of 7,598 square miles shown as being thus managed on behalf of these bodies at the commencement of 1885, about 100 square miles belong to public institutions, and about 7,500 square miles to communes, including sections. Of the remainder of their forests, about 410 square miles owned by the latter and about 27 square miles by the former are managed respectively by the communes themselves under the municipal laws, and by the administrative councils of the institutions.

Changes in this respect frequently take place; for every year a certain number of applications to free forests from the restrictions which State control involves are granted, while in other cases the owners demand or consent to their imposition. The records show that sanction has, since the year 1855, been accorded to the clearing of thirty-five square miles and to the alienation of forty square miles of the forests belonging to these bodies, but it is probable that the permission has not, in all cases, been acted on.

For the sake of convenience the forests belonging to communes, sections and public institutions will in future be spoken of collectively as "communal forests."

Demarcation and Survey.

Up to the end of 1876 the work of demarcation had made good progress in the State forests, only 13 per cent. of which then remained to be completed, while 30 per cent. of the communal forests had still to be dealt with. The demarcation is indicated by dressed-stone pillars, with intermediate ditches or dry-stone walls, according to the custom and resources of each locality. The ground is usually resurveyed after the demarcation has been completed, and at the end of 1876 about three-fourths of the State forests and one-half of the communal forests had been thus re-surveyed and mapped, the prevailing scale being $\frac{1}{5000}$ (12 2/3″=1 mile) and $\frac{1}{10000}$ (6 1/3″=1 mile). Pending the completion of this work, the old maps are used for such of the forests as have not yet been resurveyed. In the communal forests the work of demarcation and survey is less advanced than it is in the State forests, because the charges for such work have to be defrayed from the communal treasury, and the needful funds are not always forthcoming.

Systems of Culture.

The climate of France is singularly favorable to the natural regeneration of forests, which is, generally speaking, relied on—planting and sowing being only resorted to in the comparatively rare instances in which success cannot otherwise be achieved, such cases including, of course, the stocking of extensive blanks.

There are two main systems of culture—one known as "high forest," and the other as "coppice."

A high forest, which is usually destined to produce timber of large size, is one composed of trees that have been raised from seed, its regeneration being effected by means of seed, generally speaking, self-sown. There are two methods of treating the forest in order to produce this result. In one of these the trees of each age-class are grouped together, and are subjected to periodical thinnings, until the time arrives for regeneration, which is effected by a series of fellings, the first being a more or less light thinning, intended to promote the formation of seed and the springing up of the young seedling plants. The seed-felling, as this is called, is followed at intervals by a series of secondary fellings, usually three or four in number, which are made in order to meet the gradually increasing requirements of the young growth in the way of light; and ultimately the remainder of the old stock is removed by a "final felling." In this manner the marketable stems are gradually cut down and disposed of, the young crop being left to go through the same stages as its predecessor, and so on throughout successive generations of trees. In the selection method (known as *jardinage*), on the contrary, the trees of all ages are mixed over the whole area of the forest; there are no regular thinnings of the kind made under the first method; and the annual cuttings are effected by taking marketable trees here and there within a certain area of the forest, the blocks composing which are successively treated in the same manner, so that the entire forest is worked over within a fixed period of time. When treated by the first method, the forest is grown under very artificial conditions; for the aged classes are never in nature found thus grouped together; but by the selection method, on the contrary, a more or less near approach to a natural forest is obtained.

In the coppice system the regeneration is principally effected by means of coppice shoots.

There are two methods of treatment, *simple coppice*, in which there are no reserve trees, and the crop is clean-felled over successive portions of the forest:

and *coppice under standards*, in which standard trees are selected and reserved, with a view to their remaining throughout several generations of coppice shoots, generally at least three, but often four or five. Many forests are now undergoing conversion from the system of coppice to that of high-forest.

The following statement shows the extent to which the two systems were applied in the State and communal forests in 1876, since which year no important changes have taken place. The areas are given in square miles:

	High forest	Under conversion.	Coppice.	Pastures.	Total.
State forests	1,648	1,121	740	225	3,734
Communal forests	2,229	54	4,808	92	7,183
Total	3,877	1,175	5,548	317	10,917

It will be seen that there is a marked difference between the State and communal forests in this respect. In the former nearly three-quarters of the total area are either now under high-forest or under conversion to that system; while in the latter two-thirds of the total area are under coppice, and less than one third is either under high forest or under conversion.

High forest being usually destined to produce large timber, the trees must be left standing until they have attained a considerable age; and the capital, both in timber and money, which is locked up in it is therefore much larger than that in a forest under coppice. Other conditions being equal, the quantity of wood produced annually is, however, much the same under both systems; but owing to the greater value of the produce obtained from the high-forest, its money revenue is greater than that of the coppice, while on the other hand, it is found that coppice yields a higher rate of interest on its smaller capital value than than high forest, and on this account it is a more suitable system for adoption by communes. Coppice possesses, also, a further advantage for them, in that it yields for the use of the inabitants timber and other produce more varied in kind and dimensions than are obtainable from high-forest, and it thus satisfies their requirements, which are chiefly in fuel and small-sized timber, much better than forests managed under the latter system. But even in cases where the conversion of communal coppice to high-forest is deemed advisable, it is always found difficult to reduce the annual fellings to the quantity necessary in order to allow the growing stock to accumulate to the required extent; while the small size of the greater part of these forests renders them unsuited to the treatment which they would have to undergo in order to effect their conversion. The coppice system, including coppice under standards, is therefore in vogue in almost all communal broad-leaved forests, such high-forests as the communes possess being found chiefly in mountainous regions, and being composed of coniferous trees, which will not coppice. The area of communal forest shown as under conversion, consists principally of tracts in which the coniferous trees are spontaneously taking possession of the ground and driving out the broad-leaved species. It follows from what has been said above, that the State alone can, generally speaking, raise broad-leaved high-forest on a large scale, or undertake the conversion of coppice to high forest.

A further difference between the systems of culture generally adopted for the State and the communal forests may be noted, viz., that whereas in the former

less than one-fifth of the high forest is treated by the selection method, three-fourths of the communal forest are so treated. In mountainous regions, where, as has just been said, the greater part of the communal high-forest is found, the selection method possesses incontestable advantages, in consequence of the continuous cover which it affords to the soil: but although the respective merits of the two methods, as applied to coniferous forests situated in such regions, are much disputed at present, there has of late years been an undoubted tendency to return to selection, which has for some time past fallen into discredit, and, taking the State and communal forests together, somewhat more than one-half of the total area of their high forest is now treated in this manner.

Two variations of simple coppice are sometimes practised, (1) that known in the Ardennes as *sartage*, in which, after the wood has been cut and removed, the twigs and chips are burnt on the ground, in order that their ashes may give to the soil sufficient manure to permit of the growth of a crop of cereals during the year immediately following the cutting. This system, which, as carried out in France, seems to be practised rather for the sake of obtaining the crop of corn than as a method of forest culture, is gradually dying out. It is not adopted in the areas under the State forest department. (2) That known as *furetage*, in which instead of clean cutting the coppice, those shoots only are taken which have attained to certain fixed dimensions, the operation being repeated annually, or after intervals varying from two to five years. *Furetage* prevails chiefly in the valley of the Seine, in the forests from which the fuel supply of Paris is drawn; but it is also employed in the mountainous districts of the south, in the case of forests maintained for the protection of steep slopes, which it is undesirable to denude entirely.

It it is impossible here to enter into anything like full details regarding these sylvicultural questions. To study them completely, as they are taught and practised in France, reference must be made to the books on the subject, among which may be mentioned "The Manual of Sylviculture," by G. Bagneris, (translated into English by Messrs. Fernandez and Smythies), Ryder & Son. London; and "*Le traitement des bois en France*," by C. Broillard, Berger-Levrault, Paris.

Working Plans.

Working plans or schemes, will, in course of time, be prepared for all forests administered by the forest department. The law provides that all these forests shall be subjected to the provisions of such plans, and that no fellings which are not provided for therein, and no extraordinary cuttings, either from the communal reserve, or in the blocks destined to grow from coppice to high forest, shall be made without the express sanction, in each case, of the government, by whom all plans must be approved before they can be adopted.

Subject to due provisions being made for the exercise of rights of user, the working plan provides for the management of the forest in the way that will best serve the interests of the proprietor. Unlike an agricultural crop, which ripens and is gathered annually, trees take many years to grow to a marketable size, the actual period that they require being dependant not only on their species and the natural conditions under which they are grown, as climate, soil, etc., but also on the use to which they are to be put. Thus a coppice being required to yield wood of small size only, may be cut every twenty-five to forty years, whereas a high forest, which is destined to produce large timber, must stand for a much longer time. It would be excessively inconvenient if the entire crop of such a forest were felled only once in every 100 or 150 years; and it is chiefly to avoid this that a working plan is required, which prescribes the arrangement necessary

in order to allow of the produce being taken out annually, without intermission and in equal quantities, so that a regular and sustained income may be drawn from the forest. For example, a simple coppice thirty acres in extent, of which the crop is to be felled at the age of thirty years, might either be entirely cut down at one time, and then allowed to grow up again for thirty years, or, which would be found much more convenient, it might be divided into thirty one-acre compartments, each of which is to be felled in succession, so that by taking one plot each year, the whole area would be worked over in thirty years. The working plan must then, in the first place, prescribe the age at which the trees are to be felled, with reference to the average number of years that they take to arrive at maturity, or to attain the required size, and it must then fix the yield, or the amount of wood to be annually removed, this quantity being expressed either in the form of an area to be cut over, or a number of cubic feet of wood to be taken out. But in the case of a high forest managed under the selection method, it is sufficient to fix the number of trees of a minimum size to be cut out annually.

The provisions of a working plan vary according to the nature of the forest to which it relates. In the case of the simple coppice instanced above, the first thing to do would be to obtain a map showing the principal features of the ground, such as the edge of the plateau, the stream, and the road. The area would then be broken up, for purposes of examination and description, into temporary plots, each plot comprising a portion of forest more or less homogeneous in its composition. This study of the crop would enable the area to be divided into the thirty permanent compartments above alluded to, and it would also determine the order in which they should be numbered, so that the older portions might be cut first. It is evident that if one of these be cut every year the series of compartments will, after the lapse of thirty years, contain forest of all ages, from one to thirty years; and if the annual felling be invariably made in the oldest compartment, it is evident that the age of the crop cut will always be thirty years.

To make a working plan for a regular high forest, to be treated by successive thinnings, is not quite such a simple matter. If the forest is of great extent, it is, first of all, divided into two or more series or sections, each of which is dealt with separately. After the examination and description of the temporary plots, the section is divided into a number of equal compartments called *affectations* and when the ground has once been completely worked over the crop on each of these will always be, within certain limits, in the same stage of development, and subjected to the same kind of treatment. Thus, if the trees are to be felled at the age of 120 years, and there are six compartments, the sixth may contain the young growth, aged from one to twenty years; the fifth young poles from twenty-one to forty years old, and so on; the first containing the old trees which are to be felled. The compartments having been formed, each of them is then sub-divided into compartments usually corresponding in number with the years over which the fellings within it are spread (twenty in this case), and while the trees are being cut in the first compartment, clearings and thinnings of various recognized degrees are going on in the compartments of the others, until each in its turn arrives at the age at which the trees are to be removed; and it is clear that in this case also the forest will ultimately contain a due proportion of trees of all ages, from one to 120 years, which is an essential condition.

The working plan prescribes the order in which all this is to be done, and it lays down the number of cubic feet of timber of the oldest class which are to be taken out annually from the first or oldest compartment, so that the entire stock on it may be removed within the first period of twenty years, windfalls and dead

or dying trees being always taken first; each of the remaining compartments is similarly dealt with when its turn to be felled arrives. The quantity of wood to be removed by thinnings cannot be prescribed by the working plan, as they must be made to the extent which is judged necessary in order to develop the trees which are left. The forester's art is to do this skilfully, and ultimately to remove the old trees in such a manner that they may leave behind them a young self-sown crop to take their place, and so on throughout successive generations.

For a high forest to be managed under the selection method the arrangement is different. Here it is, of course, equally necessary that all the age-classes should be represented in due proportion, but instead of the trees or poles of each class being grouped together in separate compartments, all classes are mixed indiscriminately over the entire area of the forest, and there is thus no necessity for the formation of *affectations*, or compartments, of the kind just described. After the main features, such as the streams, ridges and roads, have been laid down on the map, the temporary plots, and the descriptions of them are made as before. The forest might in the present case be divided into three sections, the upper of which being on the crest of the hill, is required to be kept as dense as possible, and will not be dealt with in the working plan, as dead or dying trees alone will be removed from it Suppose that the annual yield of the central section which is 150 acres in extent, has been fixed with reference to the estimated rate of growth and degree of completeness of the stock, at 50 cubic feet per acre, and the trees of marketable girth within it contain on an average 100 cubic feet of timber, it follows that the number of such trees which may be removed annually from the section is $\frac{150 \times 50}{100} = 75$. Theoretically this number should be taken one here and one there over the whole area; but this would be very inconvenient, so the forest is divided into twelve or any other convenient number of equal or nearly equal blocks, from each of which, in succession, the entire number of trees is to be cut; after taking windfalls, the choice falls on the ripest trees, those which are dead or dying being selected first. The section below the road is in another zone of vegetation; it is 100 acres in extent, and its annual yield is calculated at the rate of 60 cubic feet per acre. Suppose, then, that the trees of marketable girth contain on an average 110 cubic feet of timber, the number of such trees to be cut annually $\frac{100 \times 60}{110} = 54$. The section will then be divided into blocks, from each of which in succession the entire number of trees is taken. In this manner each zone of altitude may be dealt with on its own merits, while at the same time, the annual fellings being localized, are easy to supervise, and the wood can be disposed of more readily and more profitably than if the trees had been felled here and there over the entire area. The working plan for a forest under conversion would, of course differ from any of the above; but this somewhat complicated question will not be dealt with here. It is only by an arrangement similar to one of those above briefly sketched that a permanent annual yield of a particular class of produce can be assured, and that the forest can be secured against the risk of gradual extinction.

A special branch of the forest department is charged with the preparation of working plans, which are not made by the local officers, except in the case of small forests, the plans for which they can frame without interference with their ordinary duties; but they undertake the revisions, which are made every ten or fifteen years in order to guard against errors, and to allow for changes in the rate of growth, or other causes of disturbance. Pending the preparation of such regular plans the forest department draws up provisional rules, which must accord with local usages, where these are not opposed to the recognized principles of sylviculture. Up to the beginning of 1877 regular working plans had been

completed for more than two-thirds of the total area of the State forests, and for somewhat less than one-half of the communal forests. The work progresses more slowly in the latter than in the former, because in their case the funds have to be provided by the communes, and the money is not always available; but as a matter of course the most important forests were taken in hand first, and these have for the most part been completed.

The question of working plans has only been dealt with above in an extremely superficial manner. In order to gain anything like a complete idea of the systems pursued in France the following works, should, among others, be studied, viz., "Amenagement des Forets," by C. Broillard, Berger-Levrault, Paris, 1878, and "Amenagement des Forets," by A. Puton. A translation of the latter work has appeared in vols. VIII. and IX. of the "Indian Forester."

Products Obtained from the Forests.

The yield in wood of various classes having once been fixed by the working plan it is the business of the department to realize it as nearly as circumstances will permit.

As to tanning bark, all that the felled trees or poles will yield is utilized. Cork bark is taken from the living trees, which will not bear the removal of a too large proportion of their protecting covering, and hence care has to be taken not to overwork them. Resin is collected on a large scale in forests of maritime pine (*Pinus maritima*), which only yields it freely on the hot and damp coasts of the south-west.

The yield of minor produce, such as grass, moss, litter, and other things, being small, and details regarding it not being available, this class of products cannot receive more than a passing mention. Neither can account now be taken of the numerous advantages which the forests undoubtedly render to the population, but which cannot be expressed in the bulk or weight of the products drawn from them.

The latest available statement of yield relates to 1876, in which year the state and communal forests taken together gave 5,620,663 loads (50 cubic feet) of wood, or an average of about 40 cubic feet per acre; also 50,742 tons of tanning bark, 292 tons of cork bark, and 1,967 tons of resin.

The yield of wood per acre of the State forests somewhat exceeded that of the communal forests; but while, in explanation of this, it must be said that the greater extent to which grazing is practiced in the latter affects their wood production unfavorably, it must also be admitted that a large proportion of their produce is made over to the inhabitants for their own use, and that this is estimated at a low figure, so as to reduce as far as possible, the charges against them on account of management by the forest department; and the apparent difference is largely due to the latter cause. Of the total yield in wood 1,364,846 loads were timber and 4,255,817 loads were firewood; and as might be expected from what has been said before regarding the different systems of culture adopted, the State forests give the larger proportion of timber, one-third of the wood from them being of that class, while in the case of the communal forests, the proportion of timber was only one-fifth. A still more striking result would follow a comparison of the nature of the produce obtained from the State and from private forests; and since timber is a more useful and valuable product than firewood, the advantage to the country from this point of view, of considerable areas of forest land being owned by the State is apparent, and the more so when it is remembered that France does not grow more than two-thirds of the amount of building timber that she consumes.

The communal high forest is for the most part situated in the mountains, and is composed of coniferous trees, which explains the fact that the greater part of the timber derived from the communal forests is fir and pine, whereas only about one-third of that coming from the State forests is of those kinds.

Sales and Export.

Principal produce (wood, bark and resin).—With the exception of the produce made over to right-holders, and of that delivered to the inhabitants of the communes from their forests for their own consumption, as well as of comparatively small quantities of timber cut in the State forests for the war department and admiralty, the whole of the annual produce is sold by public auction, and no other mode of sale is permitted. There are three principal systems of disposal, viz.:—First, sale of standing trees; second, sale at a rate per cubic metre, or other unit of the produce, cut, converted, and taken out by the purchaser; and third, sale of produce cut and converted by departmental agency. The first of these systems necessitates a previous marking, either of the trees which are to be removed, or of those which are to be reserved. There is no guarantee given either as to the number of trees, or as to their species, size, age or condition; but they are bought and sold on the best estimate that either party can make of their value as they stand. The purchaser, as a matter of course, cuts up and exports the wood at his own cost, and in the form which best suits him, being bound under severe penalties to carry out this work in the manner prescribed by the conditions of sale. It has been urged that this system needlessly introduces a middle man between the producer and the consumer, and that thus the profits of the former are reduced, while the regeneration of the forest may be compromised by felling and exporting the trees in a careless or ignorant manner; but in reply to this it may be said that the wood merchant must always exist, as it is but rarely that the actual consumer can himself go to the forest to get what he wants, and that by strictly enforcing the conditions of sale, which are framed with special regard to this object, interference with the regeneration of the forest is practically avoided.

The second method differs from the first only in that the auction sale determines the rate at which each of the various classes of produce is to be paid for; but it is open to the objection that the classification of the produce is difficult, and it thus leads to frequent disputes, in the settlement of which the interests of the proprietor (State or Commune) may be allowed to suffer. This method is rarely adopted, except in the case of thinnings, when the quantity of wood cannot well be accurately estimated beforehand.

The sale of timber, cut and fashioned by departmental agency, is rarely resorted to. It has certainly the advantage that the work is better done, and that more complete precautions can be taken to secure the regeneration of the forest; but on the other hand, the State or the commune, as the case may be, must advance all the money for the work, and the forest officers become charged with a large amount of supervision and accounts, while a number of purchasers are admitted to the forest, and offences of various kinds are from time to time committed by them. But the chief objection to the system is that the wood is not always cut up in the manner which best suits the requirements of the market at the moment, a matter with which the forest officer can never be so well acquainted as the professional timber merchant, and thus not only do the general interests of the country suffer by failure to supply wood in the form in which it is

most required by the consumers, but the prices realized are not always so good as those which the produce might have been made to fetch, had it been cut up in some other manner.

Timber sold standing, usually commands a higher rate than it does when disposed of in any other manner, and for this and the other reasons that have been given, the first of the three systems is the one generally adopted in both the State and the communal forests. This method of sale is not generally followed in other European countries; but the French system has stood test of experience; and it is greatly facilitated by the honesty which, as a general rule, prevails in the trade to which it has given rise. In consequence of the absence or insufficiency of export roads in Corsica, and of the difficulty experienced in getting purchasers who are willing to take the produce for a single year only, a law was passed in 1840, which enacted that the timber to be cut in any part of that island during a series of years not exceeding twenty, might be sold at one time to a single purchaser, the State, at the expiry of the term, becoming possessed of all works erected by him without liability to the payment of compensation for them. A few of such contracts exist to the present day; but both the system of roads and the timber trade having largely developed during the last forty-five years, the practice of entering upon such engagements is gradually dying out.

Minor produce.—Receipts on account of minor produce form an insignificant portion of the gross revenue derived from the French forests, the most important item being that which is due to the sale of hunting and shooting permits. Produce of this class is not sold so much as a source of revenue, as to enable the agricultural population to make use of it, without giving rise to the idea that they are entitled to it by right. It is sold by private contract, the price being fixed by the conservator, or by the prefect, or the mayor, in the case of the State and communal forests respectively. The conditions under which such sales are effected in the State forests are determined by each conservator, with reference to local circumstances, and he retains the power to forbid the sale from the communal forests of any classes of produce, the removal of which would, in his opinion, be detrimental from a cultural point of view. Payment for minor produce is often accepted, especially by the communes, in the form of days' work done in the forest.

Wood supplied to the admiralty.—Every year a notice is sent by the forest department to the admiralty, showing the localities in which trees suitable for naval purposes are to be felled; and the latter department then notifies the number and description of those which it desires to have reserved in each forest. The purchaser of the timber sold from these blocks, fells, barks and conveys the trees marked for the above purpose to an appointed place in the forest, where they are inspected and taken over by the admiralty officials, who cut from them what they want, the rest of the wood being sold by the forest department in the ordinary manner. The forest officer and the marine engineer then agree upon the sum to be paid as the price of the wood removed, and as compensation, to cover losses caused by the depreciation in value of that rejected, and the account is subsequently adjusted in the financial department. Up to the year 1837 the admiralty had the right to select trees everywhere, including the private forests; but the system was not found to answer, and it was abandoned in that year. Even under existing regulations a very small proportion of the wood used by the admiralty is obtained directly from the forests, the greater part of it being bought in the open market.

Wood supplied to the war department.—The requirements of the war department are met, as far as possible, from the State forests, the trees being marked and felled by the forest department, and removed either directly by the military authorities, or by the forest department at their cost. The account is adjusted in the financial department. But the amount of wood so supplied is very small, as, except in cases where the State forests lie near the fortifications or garrison towns, it is found more convenient and cheaper to purchase what is required in the market.

Roads and Buildings.

Without roads, which are required in order to render the forest accessible and to facilitate the export of produce, this form of the natural riches of a country cannot be utilized; the construction of good export roads being one of the most important means than can be adopted for raising the forest revenue. Thus in Corsica, where, before 1850, the State forests did not produce more than £200 a year, the annual revenue derived from them was raised in 1868 to £8,000, the improvement being due almost entirely to the development of the communications. At the end of 1867 there were 2,440 miles of metalled, and 5,380 miles of unmetalled, roads in the State forests, and since that year their length has been at least doubled.

The great importance of accommodating the forest guards in suitable houses within the forests is fully recognized; and out of 3,200 guards, 1,400 are lodged in 1,213 houses, the remainder of them being granted allowances to lodge themselves in neighboring villages. The proportion of roads and buildings in the communal forests is much less than in the State forests, partly because the communes have to pay for their construction, and funds are not always available, but partly also because the average size of these forests, being smaller, roads and guards' houses within them are not needed to the same extent.

At the end of 1867 there were 126 saw-mills in the State forests, all worked by water-power.

Timber-slides, sledge-roads, wire-rope tramways, and such like means of exporting the wood, are very little used in France. A great deal of timber is required for their construction and maintenance, and, considering the price that wood of all kinds can command, it is found better and cheaper, even in mountainous regions, to make permanent roads suitable for timber carriages and carts. They are to be found only in a few localities where the conditions are exceptional.

Portable iron tramways have not yet come into general use as a means of exporting timber from the forests, and it is believed that there is only one in use in France at the present time, viz., that at Baccarat at the base of the Vosges; but the advantages which the employment of this means of transport affords will doubtless shortly be better understood than at present, and a development of the system is to be anticipated, at any rate, in the forests of the plains. The floating of large timber is almost unknown; but firewood for the supply of Paris is still floated from the hills of Morvau down to the railways.

Financial Results of Working.

The profit derivable from a forest is dependent on a number of causes, among which may be mentioned the species of which the crop is composed, the depth and nature of the soil, the climate, the system of culture, the proximity of great centres of consumption of produce, and the existence of good lines of export.

Taking the average of the last three years for which the accounts have been audited, it is found that the receipts, expenditures, and surplus of the State forests were as follows, viz.:—

Revenue	£1,297,748 = 10s.	6d. per acre.
Expenditure	571,347 = 4	7 "
Surplus	£726,401 = 5s.	11d. per acre.

But if the money spent on the afforestation of mountain slopes and dunes, and on the purchase of additional areas, be excluded, the expenditure on the existing forests is reduced to about £480,000, and the surplus is raised to 6s. 8d. per acre. The actual profit is indeed slightly more than this; for the figures include both expenditure by the State on the management of the communal forests, and the contributions paid by the communes on this account. The receipts are supposed to cover the payments, but they rarely do so, and some allowance may be made for this fact when calulating the net profits derived from the State forests, which, during the years referred to, probably fell little short of 7s. an acre. Recent information relating to the receipts, expenditures and surplus resulting from the working of the communal forests is not available.

The latest year for which full details regarding the gross revenue per acre of the State and communal forests are obtainable is 1876, when the figures were as follows, viz.:—

——	State.	Communal.	Mean.
	s. d.	s. d.	s. d.
Principal produce (wood, bark, resin)	12 6	7 5	10 0
Minor produce	0 7	0 3	0 5
Total	13 1	7 8	10 5

The revenue from the State forests was then, in 1876, considerably higher than that above given as the average of the last three years; and this was due to two causes, of which the first is the exceptionally large number of windfalls which occurred in that year, and the second the comparatively high rates which timber than realized. All but a small fraction of the revenue on the principal produce was obtained by the sale of wood and tanning bark, cork being produced only in the forests near the Mediterranean and in Corsica and resin almost exclusively on the shores of the south-west. The figures relating to the State forests show the results of actual sales, but this is not so in the case of communal forests, as a large proportion of the produce from them is made over to the inhabitants for their own use, and its value is estimated at a low rate, in order to keep down the amount of their contribution for the services of the State forest department, which is levied in proportion to the sum of their gross revenue and the value of the wood delivered to them. In addition to this it should be said that the revenue on minor produce shows cash receipts only, no credit being taken for the payments made chiefly in the communes by means of days' work done in the forests. These circumstances account to some extent for the smaller revenue obtained from the communal forests; but the true explanation of this result is to be found in the important influence exercised by the system of culture adopted. In 1876 it was observed that the highest rate of gross revenue was obtained from high-forest, and the lowest from simple coppice, while coppice under standards occupied an intermediate place. It was also found

that in the case of high-forest, the area under coniferous trees yielded a much higher revenue than those under broad leaved species, chiefly on account of the form of their stems, which enables a very large proportion of sawn timber to be obtained from them, but partly also from the greater value of the thinnings taken from them during the early stages of their growth—in the form, for example of telegraph and hop-poles, etc. The revenue from forests composed of coniferous and broad-leaved trees mixed together lay between these two. But, of course, this is not an universal rule; for a high forest of beech might yield a better return than a coppice with oak standards, and a similar comparsion might be made between forests stocked with other trees of different relative values, and managed under various systems. The following figures, showing the results of sales in the Nancy conservatorship, will serve to illustrate what has been said:—

		Per acre.
Simple coppice	Yielded	4s. 4d.
Coppice under standards	"	11s. 8d.
High forest of broad-leaved species	"	13s. 1d.
High forest of coniferous and broad-leaved species	"	23s. 10d.
High forest of coniferous species	"	51s. 6d.

Looking, then, at the large proportion of the communal forests, which is under coppice and at the relatively greater proportion of firewood and timber of small size that they consequently produce, the smaller gross revenue per acre that they were able to yield is no longer surprising. Taking the State and the communal forests together, it was found that their gross revenue was 22 per cent., per acre, higher than that of the private forests, notwithstanding that these latter are as a rule, on better soil and are frequently grown under other more favourable natural conditions.

The average all-round rate actually realized in the State forests per load of wood of all sorts, including tanning bark, was 14s. 5d.; while that obtained in the communal forests was only 9s. 8d. The corresponding rate for the whole of the French forests, including those belonging to private proprietors, was 10s. 7d., so that the rate of the State forests exceeded the general average by 37 per cent., while that in the communal forests fell to 9 per cent below it. The revenue obtained by the sale of minor produce was derived principally from shooting leases and permits.

It is not an easy matter to determine the capital value of a forest, but in 1873 an estimate was made, which put that of the State forests at nearly fifty and one-half million pounds sterling, which is equivalent to a little over fifty pounds per acre. The gross revenue derived from them in that year represented a return of 3.15 per cent., but the net profit did not much exceed two per cent., on the estimated value. The capital value of the communal forests is certainly less per acre than that of the State forests, on account of the younger age at which the trees are, generally speaking, cut; and notwithstanding that their revenue is smaller, it is probable that they pay a higher rate of interest than the State forests.

It has been estimated that the relative rates of interest on their capital value, paid by forests in which the main crop is removed at various ages, is something like the following, viz.:—

	Per cent.		Per cent.
25 years	4	60 years	2
30 "	3½	100 "	1
40 "	3	200 "	½

These figures are intended to give a general idea of the manner in which, notwithstanding the increased value of the produce the relative rate of interest declines as the age to which the trees are left standing is prolonged. They have no claim to absolute accuracy, even as representing the average of French forests, and still less can they be assumed to apply to the forests of other countries. They serve, however, to explain what has been previously said, viz., that on account of the higher rate of interest which coppice, generally speaking yields, as well as for other reasons, it is a more suitable system for communes than high forest; and this remark applies with equal and even greater force to private forests.

Rights of User.

The principal rights of user are those relating to timber, firewood and grazing; but there is also a small number of others, such as those which permit the cutting of turf, the collection of dead leaves, and the like injurious practices. In the State forests the right-holders are, almost without exception, village communities; the instances in which private persons possess rights in them being extremely rare. The communal forests are, comparatively speaking, free from such burdens.

The law of 1827 provided for the investigation and disposal of all claims to exercise rights in the State forests, and barred the acquisition in them of any fresh ones. Hence those only have now to be dealt with which have been formally admitted and recorded in favour of the communities or persons who possess them.

The aim of the department has always been to free the forests from such claims as far as possible, and the law provides for this being done in the following manner, viz., all rights of wood may be commuted by surrendering a portion of the forest itself in lieu of them, the terms being arranged by mutual consent, or in case of disagreement by the courts; but the State alone can demand such a commutation, the right-holder cannot do so. Other rights, including those of pasture, cannot be got rid of in the above manner, but the State can buy them out by the payment of a sum of money, the amount of which is either settled by mutual agreement or by the courts. The sale of pasture rights cannot, however, be enforced in places where their exercise is absolutely necessary for the inhabitants, the question of such necessity being, in case of dispute, referred to the *conseil de prefecture*,* subject to an appeal to the *conseil d'etat*.† The law also provides that the exercise of all rights which have not been got rid of in either of the above ways, may be reduced by the forest department with reference to the condition of the forests and the mean annual production of the material in respect of which they exist; and none can be exercised otherwise than in accordance with the provisions of the law and the rules based on it.

The principal features of the legislation regarding the exercise of wood-rights are the following, viz. No wood can be taken which has not been formally made over by the forest department; persons who possess a right to dead fallen wood cannot employ hooks or iron instruments of any sort in its collection; when firewood is made over standing in the forest, it is felled, cut up and taken out by a contractor, selected and paid by the right-holders, but previously approved by the forest department; the partition of the wood among the inhabit-

* An administrative tribunal, established in each department of France.

†The central administrative tribunal, established at Paris for hearing appeals from the decisions of the *conseils de prefecture*.

ants cannot be made until the work is entirely completed; the contractor is responsible in all respects as if he had been the purchaser of the produce, but he acts under the pecuniary guarantee of the body of right-holders, who cannot barter nor sell the wood made over to them, nor put it to any use other than that for which it is given to them; timber made over in satisfaction of a right, but not used in a period of two years, may be reclaimed by the forest department.

No right can exist to take goats into either the State or the communal forests, as the grazing of these animals is considered incompatible with the maintenance of the ground under wood. The old law suppressed without compensation to the right-holders, the practice of grazing sheep in the forests of the ancient royal domain of France, and the law of 1827 suppressed it also, on payment of compensation, in those State forests which are of more recent origin; but the government has the power to permit sheep grazing in certain localities as an exceptional and temporary measure. No right to pasture any kind of animals can be exercised in any part of the forest not declared out of danger by the forest department, which has also the power to limit the number of animals to be admitted, and the period during which they may graze, with reference to the condition of the forest and the quantity of grass in it. Right-holders can only pasture animals which they keep for their own use, not those which they keep for sale.

On the first of January 1877, about one half of the total area of the State forest was burdened with rights of the estimated annual value of £38,400, while only three per cent of the communal forests were so burdened, the annual value in their case being estimated at £6,700. The commutation and purchase of rights, which was commenced in a systematic manner in 1857, is effected by the officers of the ordinary service, as well as by those who are charged with the framing of the working plans. As a general rule, the arrangement with the right-holders is made by mutual consent, appeals to the courts being of rare occurrence. The State is in no hurry to spend large sums in the purchase of grazing rights which will probably disappear with the progress of agriculture; a result which has alredy been realized in the north of France, where the greater portion of these rights has lapsed through failure to exercise them.

Grazing.

Goats, sheep and cattle have always been the emenies of forests, and they are indeed the principal agents of their destruction, especially in hot and dry climates, where the vegetation is not sufficiently vigorous to resist the effects of over-grazing.

Animals are admitted to the forests under three different conditions, viz:—

(*a*) In virtue of a right of user.

(*b*) As a means of raising revenue and of utilizing the grass.

(*c*) By tolerance, as a temporary arrangement.

Grazing by right. This has been treated of in the preceding section.

Grazing as a means of revenue and of utilizing the grass. Neither goats nor sheep are admitted into the State or communal forests with this object. In the State forests it is sometimes the custom to allow cottagers living near the forest to graze their cattle in exchange for a number of days' work, but this is not done to any important extent. In these forests in fact very little grazing is sold, for the practice can only be permitted in the unwooded portions, which are rarely

available for the purpose, because, although they are of considerable extent (about 450 square miles) they are either required as grazing grounds for the cattle of right-holders, or they are being planted up, and hence the revenue from this source is insignificent. It was only £360 during the last year for which the record is available, but it is otherwise in the case of the communal forests, where local custom often necessitates the maintenance as pasture land of blanks, which could otherwise be most advantageously filled up; and some communes derive almost their entire revenue from this source. The receipts by them amounted in the same year to nearly £15,000.

Grazing by tolerance—It has been said that no right can exist to graze either goats or sheep in the State or communal forests; and the inhabitants of the communes are specially prohibited by law from admitting their own goats and sheep into their forests; but the government has the power to sanction the grazing of sheep (not goats) in certain localities under exceptional circumstances. Permission to drive sheep into the State forests is, however, very rarely accorded, except in seasons of extraordinary drought, when the flocks of the neighborhooding communes are sometimes admitted for a single season. But in the case of the communal forests, such temporary sanction is, of necessity, more freely accorded, for the forests belong to the inhabitants, and even through their true interests might be better served by keeping out their sheep entirely, it is not found possible to change their pastoral habits all at once; and on this account, permission has frequently to be granted them to graze their sheep in their forests, eitheir for a single year or for periods up to five years. They can, however, graze their own horned cattle, horses, ponies, donkeys and pigs there without special permission; and they usually do so on payment of a fee into the communal treasury. According to the latest available record, the number of animals of all kinds, thus admitted in a single year, was as follows, viz.:

Horned cattle, horses, ponies and donkeys.	359,164
Pigs	48,388
Sheep (by special sanction)	936,960

The animals can, however, only be grazed in places which have been declared out of danger by the forest officers, and their numbers can be limited with reference to the quantity of grass available; but it is not always possible to enforce these restrictions rigidly; and the forests in certain regions, have much to contend with from the extent to which grazing is practised. The receipts by the communal treasury on this account have been estimated at 4s. 6d. per head of large cattle, 3s. 11d. per pig, and 1s. for sheep; but this only represents an average revenue of 10d. per acre of the area grazed over, whereas wood yields, on an average, about 8s. 4d. per acre; and it seems probable that this consideration may gradually lead, in the agricultural districts, at any rate, to the abandonment of the practice of pasturing cattle, on forest lands. There is no doubt that when the grazing even of large cattle, is permitted, it is carried on at the expense of the crop of wood; and that where it is practised to any considerable extent the forest, properly so called, tends to disappear; and this is notably the case where, for the time being, local circumstances, such as the absence of export roads, renders wood a less profitable crop than grass. Here the forests, gradually become almost unproductive, and finally succumb from excessive grazing.

About four-fifths of the total area of the communal forests are still used as grazing grounds, nearly one-half of the latter being open each year; and the average area provided for each class of animals is about three acres per head of large cattle, two acres per pig, and three-fifths of an acre for sheep. Separate

grazing grounds are allotted for each class, and these figures represent the average of all qualities of pasture land; they could not therefore, even supposing that the grazing were not excessive, be taken as a guide to the area which should be provided per head in any particular locality, even in France, and still less so in other countries.

Offences.

Until the year 1859 persons who were charged with offences against the forest laws had always to be tried by the courts; but in that year a law was passed which enabled the forest department to take compensation from offenders instead of bringing them before the tribunals, and this method of dealing with them is now largely practised. The department has always the power to charge the delinquents before the courts, while they, on the other hand, have always the right to refuse payment of the compensation demanded, and thus bring about their formal trial. Officers of lower rank than that of conservator are not, however, authorized to deal with cases in this manner, and the power of the conservator is limited to the acceptance, by way of compensation, of sums not exceeding £40; if it is desired to exact a larger amount, the sanction of the government must be obtained.

This system has many advantages. For while it is necessary in the public interests that infractions of the forest rules should be checked, a large proportion of them are usually of a petty nature, and in many cases the persons who commit them hardly deserve the severer penalties that must be inflicted on their being found guilty by the courts. The system of taking compensation, on the other hand, permits the adoption of a scale of punishment more suited to this class of offenders, while it at the same time enables the means of the delinquents, and the attendant circumstances of each case, to be taken into account. The punishment can also be made to follow promptly the committal of the offence, without the necessity for dragging the accused and the witnesses from their occupations to attend before a tribunal, the time of which is thus not occupied in the trial of these petty cases. The present system is easy and simple for the forest department; and that it acts very leniently on the population living near the forests will be seen, when it is stated that the amount of compensation exacted during the last year for which the record has been prepared, amounted to only one-fifth of the sum which the courts must have awarded had the offenders been proved guilty before them. Occasionally the compensation is allowed to be paid in the form of a number of days' work, done in the forest.

With the advancing prosperity of the country, forest offences become less frequent, and the number committed annually is very much smaller now than is used to be a few years ago. It is worthy of remark that they are more than twice as numerous in the communal as in the State forests, probably because individual inhabitants of the communes think that there is not much harm in committing minor depredations on property which they doubtless regard as their own. During the year 1876, the number of offences was 26,377, there being three per thousand acres in the State forest, and seven per one thousand acres in those belonging to the communes. More than half the offences were connected with the theft of wood or injury to trees, and nearly a quarter related to pasture and cattle trespass, 31,231 persons being involved in the charges. As might be expected, wood stealing is more prevalent in winter than in summer, while the reverse is the case with regard to breaches of the grazing laws. Of the total number of charges made in 1876, 7 per cent. were abandoned, either owing to the trivial nature of the offences, or owing to want of sufficient evidence; 70 per

cent. were dealt with under the compensation law, and the remaining 23 per cent. were taken into court, convictions being obtained in 99 per cent of these cases.

In addition to clauses dealing directly with wood thefts, illicit grazing, and other fraudulent practices, the forest law provides that no person having cutting instruments in his hand can leave the ordinary roads which pass through the forests, and that no fire can be either lighted or carried within, or at a less distance than two hundred yards from any forest boundaries. A regular tariff exists, which fixes the penalties for damaging trees of various ages and species. The law also prohibits the erection, without permission, of brick-works, or lime-kilns, carpenters'-shops, timber-yards, or saw-mills, within certain distances of the forest. At the time that the law was passed, it was much more necessary than it is at present to check the erection of such buildings, and applications for permission to construct them are now usually accorded on suitable conditions.

Injuries Caused by Wild Animals and Insects, Storms and Fires.

Wild animals and insects.—The principal wild animals which cause injury to forests, either by devouring the seed or the young seedlings, or by peeling the bark off the young plants, are deer, pigs, hares and rabbits. The insects which attack the leaves, the bark, and even the wood of trees, belong chiefly to the families *Coleoptera*, *Lepidoptera*, and *Hymenoptera*. But the damage done is not excessive, and it is, in fact, far less than that produced by the same causes in many other countries. It is of course exceedingly difficult to put a money value upon injuries of this sort, which include not only the actual death of a certain number of old and young trees, but also a reduction in the growth of others. An estimate was, however, made regarding the damage done in 1876, and it is said to have amounted to about 4s. per 100 acres, taken on the entire area of the State and communal forests. The coniferous trees generally suffer more than the broad-leaved species, as they are more exposed to the attacks of insects which do not infrequently kill them outright, whereas the latter species more often suffer merely a diminution in their rate of increase.

Storms.—The damage done by storms of wind is a much more serious matter. Injuries are caused to the forest by them which it is not always possible either to prevent or even to modify. In the first place, the windfalls interfere with the arrangements laid down in the working plan, and the considerations which guide the execution of felling are thus thrown out; they remove too large a proportion of the seed-bearing trees, and consequently it is sometimes necessary to substitute a difficult and artificial process for the natural regeneration which would otherwise have been effected; while in addition to this they break or otherwise damage neighboring trees by their fall. In the second place, the value of the windfalls themselves is, speaking generally, small, as they are frequently broken or otherwise injured, while most of them have probably not attained the age or dimensions at which it was intended that they should be felled. They are also specially liable to attacks by insects, which often appear in large numbers in forests where many trees were blown down, particularly in case of the coniferous species. Even uninjured windfalls fetch a lower price than trees felled in a regular manner, because they are usually found scattered here and there, instead of being concentrated in one part of the forest.

The year 1876, which is the last for which figures can be obtained, was a disastrous one, the amount of windfalls being exceptionally large, probably double of that which occurs during an average year. The number was put

at 1,145,708 trees, and the damage caused was estimated at £10,300, or about £3 4s. per 100 acres in the State forests, and 12s. per 100 acres in those belonging to village communities.

The latter being, for the most part, coppice under standards, suffered less than the former, while the proportion of windfalls in the coniferous forests was greater than that in those composed of broad-leaved species. The windfalls were sold for nearly £621,000.

The forest officers, when arranging the annual felling, are careful to provide, as far as possible, against the effect of storms, by leaving a protecting belt of trees standing on the side of the forest from which the dangerous winds blow, and in other ways; but much depends on natural conditions which are beyond their control, such as the configuration of the ground, the shelter afforded by neighboring hills, the nature of the soil and its physical condition, the kinds of trees and their root development, as well as their size, age, and the system of treatment to which they have been subjected.

It may be added that hailstorms often do great damage by stripping the trees of their foliage, and by breaking or otherwise injuring the young plants.

Fires.—The penal code provides for the punishment of persons who cause forest fires, either intentionally or through carelessness: and the forest law prohibits the lighting or carrying of fire either inside the forest or within 200 yards of their boundaries, but the ordinary laws do not prevent proprietors from lighting fires in their own forests to the danger of their neighbor's property. This an important question in the Maures and Esterel,* where the bad practice is followed of systematically lighting fires in the forests, in order to burn up the heather and other shrubs which interfere with the regeneration of the crop of trees; and in 1870 a special law was passed prohibiting the proprietors of those districts from lighting fires in their forests except at seasons fixed by the prefect; and also compelling them to clear fire-lines around all woods and forests which have not been completely freed from all inflammable shrubs.

In 1876 there were 290 fires in the area managed by the forest department, nearly all of them being the result of accident. The surface burnt over measured 2,350 acres, or about $\frac{1}{3000}$ part of the entire area, and the damage was estimated at £3,280 or 28s. per acre of forest burnt. The proportion of fires was greater in the broad-leaved than in the coniferous forests, but on the other hand, the amount of damage done per acre in the latter was three times as great as in the former, the resin in the trees themselves and in the dead needles on the ground rendering the fir and pine forests excessively inflammable. It is also worthy of remark that, although as a general rule, fires were of more frequent occurrence in the spring than at any other season of the year, the autumn fires were, on account of the recently fallen leaves, by far the most destructive. But this is by no means true of all regions and the general result may be mainly ascribed to the great damage done by fires occurring during the autumn in the south of France. In the north, forest fires are of small importance, and occasion little damage.

Hunting and Shooting.

The right to hunt and shoot in the State forests is, generally speaking, let out on nine years' leases, which are sold by public auction under the rules for the sale of timber and other forest produce; but when this is not possible, it is sold by means of annual permits issued under the direct authority of the Minister

* Low mountain ranges in the south of France.

of Agriculture, the sport being always carried on under the surveillance of the officers of the forest department. No forest officer can become a lessee of the shooting within the limits of his own charge, and the forest guards are never permitted to shoot in the forests under any circumstances.

The municipal councils are, subject to the approval of the prefect, free to dispose of the right to hunt or shoot in their forests in any manner that they wish.

Destruction of Wolves.

The destruction of wolves, boars, and other animals which are considered dangerous or harmful, is entrusted to a corps of 410 *lieutenants de louveterie* (wolf-hunters). These officers, who are unpaid, but have the right to wear a handsome uniform, are under the control of the conservator of forests, and are appointed by the prefect on his recommendation. They are as a rule landed proprietors, who accept their appointment for the sake of the sport it affords them. They are obliged to keep bloodhounds and packs of dogs, and are charged to organize and direct, in communication with the local forest officers, the *battues* which are, from time to time, ordered to take place in the forests. But as this system has not been found a very efficient one, a law has recently been passed, under which a reward, varying from £1 12s. to £7, is payable to anyone who kills a wolf; and the mayors are authorized, when the snow is on the ground, to organize *battues* for the destruction of wolves, boars, and other animals, anywhere within the limits of their respective communes, on condition only that they give due notice to the proprietors of the lands on which the beat is to take place.

The rewards paid for killing wolves amount to about £4,000 a year.

AFFORESTATION WORKS—WORKS UNDERTAKEN FOR THE CONSOLIDATION AND PROTECTION OF UNSTABLE MOUNTAIN SLOPES.

Excessive grazing, both by local herds and flocks principally of sheep and goats, as well as by vast numbers of these animals which are annually driven up from the plains to the hill pastures, have produced complete denudation over very large areas, and have thus caused incalculable damage in the great mountain regions of France, principally in the southern Alps, and in the level country below them. They eat down the grass to the level of the ground, and then tear out the very roots, breaking up the surface of the soil, and rendering it liable to be washed down by the rain. These hills are of a loose formation, the strata being contorted and dislocated to a remarkable degree, and as soon as the soil is deprived of its protective covering of trees, shrubs and herbs, whose roots hold it together, the slipping and falling of the mountain sides are produced with a constantly increasing intensity. The rain-water, no longer interrupted in its fall, retained by the spongy, vegetable mould, nor hindered in its downward flow by the thousands of obstacles which a living covering would oppose to its progress, flows off the surface of the ground with extraordinary rapidity, and carrying with it large quantities of loose soil, suddenly fills up the torrent beds. These latter, scoured out by the rush of water, charged with mud, stones and rocks, cut their way deeper and deeper into the mountains, and their banks, deprived of their support at the base, fall inward, the *debris* being borne onward to level ground below. The cracks and slips occasioned in this manner extend to a great distance on either side of the torrent, especially on the side on which the strata slopes toward it, and the effect is much increased when the upper layer of rock is loose, and lies upon an impermeable bed; the water then saturates

the loose rock, and penetrating through it, and through the cracks and fissures, flows over the hard surface, the superincumbent mass being precipitated, either suddenly or by slow degrees into the valley below. The same effect is produced in the whole net-work of water-courses, both principal and tributary, which traverse the mountain side; the upper strata over enormous areas, with fields, houses, and even entire villages, being carried down into the valleys, and the whole region, which presents litttle to the eye but a series of unstable slopes of black marl, has an indescribably desolate appearance. It may be added that when the hillsides are covered with trees, the snow, which has accumulated during the winter months, disappears gradually under the influence of the milder temperature which accompanies the advancing spring; but when the trees have been removed, and the masses of snow are consequently exposed to the full force of the sun's rays, they melt rapidly and produce results on the mountain sides similar to those which follow the occurrence of heavy storms of rain.

But the damage does not stop here; for on reaching the comparatively level valleys which form the main lines of drainage of the mountain range, the stones, gravel and sand transported by the numerous torrents are deposited. These valleys being usually very fertile, are occupied by fields, villages, and towns, which are connected by roads and sometimes by railways, constructed with many bridges, retaining walls and other masonry-works, and as, by degrees, enormous areas become covered with *debris*—sometimes this result is produced suddenly without warning—the buildings are either thrown down or overwhelmed, the railways and roads are blocked, and the bridges are overthrown, while the fields are completely and irretrievably destroyed. The damage thus caused is most serious, both in its nature and extent, and to it must be added the great inconvenience and loss occasioned by the interruption of traffic on the roads and railways. But this is not all. If the *debris* transported by the torrent is carried into the river before it can be deposited, it is either borne on at once and thrown on to the level country lower down, or it remains and turns the course of the stream over the fields and buildings on its opposite bank. Occasionally the deposit temporarily blocks up the valley and causes the inundation of villages and fields on the upper side of the barrier, and when this latter ultimately gives way, the most disastrous results ensue, both in the lower part of the valley and in the open country at the foot of the mountain range. It is to mitigate these terrible evils that the vast enterprise of afforesting the mountains has been undertaken as the only means of dealing with them. But, owing to the enormous cost of the work, it cannot be hoped that the forest thus raised will ever prove directly remunerative, and their creation, with a view to their ever becoming so, could not for a a moment be justified.

The works are of two classes, viz.: Firstly, the treatment of the torrent beds by a series of weirs and other structures, destined to bring them gradually and by successive stages to a normal slope, and thus not only prevent "scour," but by the filling up and widening of the beds behind the weirs to afford support to the unstable sloping sides, and thus gradually to consolidate them with a view to their being ultimately planted up. Secondly, the immediate planting up of all areas, the surface of which does not seem likely to be washed down within the period occupied by the construction in that locality of the first class of works. A commencement was made in 1860; but the law passed in that year not having been found sufficient, a new law came into force in 1882 which provides both for the works to be undertaken directly by the State, and for those to be executed by the proprietors of the ground, with or without State aid, as well as for simple measures of prevention.

Works undertaken by the State.—The proposal to take up ground for this purpose emanates from the forest department, and is followed by a formal inquiry, under the direction of the prefect, into the circumstances of the case, regarding which a special commission, with a forest officer as one of its members, makes a report. If the proposal is approved, a law is passed declaring the work to be one of public utility, and under it the ground with all existing rights, either of the proprietor or other persons in it, is bought by the State, either by mutual agreement or by expropriation. The area is then under the forest law, and the works are undertaken at the public cost.

Works undertaken by the proprietors.—If, however, the proprietors, who are for the most part village communities, do not desire to part with the land they must, before the expropriation has been ordered, agree to execute the specified works themselves, within a fixed time, and to maintain them, under the control of the forest department. In some cases, but not always, pecuniary aid is then afforded to them. If the proprietors of land outside the areas which are taken up for treatment as works of public utility, desire to undertake measures for the consolidation of the soil, or for the improvement of their pastures, they can obtain assistance from the State in the way of money, seeds, plants, or of work done for them; but when any such aid is afforded, the operations are under the surveillance of the forest department, and in certain cases the money so advanced has to be refunded.

Preventive measures.—When the condition of the ground is not such as to warrant its being dealt with in the above manner, it may, after the same preliminary formalities as before, be closed against grazing for any period not exceeding ten years, in which case compensation is paid annually to the proprietors for their loss of the use of it. During this interval the State has the power to execute works, in order to promote the more rapid consolidation of the soil, but the nature of the property cannot be changed thereby, and the proprietor cannot be called upon to pay anything for the improvements thus effected; while if, after the lapse of ten years, it is found necessary to continue the exclusion of cattle, the State must buy the land either by mutual agreement or by expropriation.

But none of the measures above described would deal effectually with the situation unless the source of the evil were at the same time attacked, by bringing the pastoral arrangements on the neighboring hills under control, so as to avoid over-grazing; and the law therefore provides that in 313 village communities, all those in which works are undertaken being included, as well as many others, the grazing must be carried out in the manner approved by the forest department. The communes are therefore obliged to submit to the prefect annual proposals on this subject, showing the nature and extent of their pasture lands, the portions that they propose to use during the year, the number of animals of each kind that are to graze, the roads by which they are to reach and return from the pastures and other matters. These proposals are considered by the forest department, and modified if necessary. In addition to this, with a view to encourage the pastoral population of the mountains to take care of their grazing grounds, and to put a stop to abuses resulting from ignorance and from the continuance of injurious customs, the forest department is empowered to grant money rewards to *fruiteres* (associations of cattle-owners for the manufacture of cheese) for improvement made by them to their pastures. It is also desired to encourage, as far as possible, the substitution of cows for sheep; but the population of the mountains does not like the afforestation of their grazing grounds, and the principal reason for the offer of rewards by the State is that it is con-

sidered politic to do something to aid them in their industry, as some set-off against the inconvenience to which individual communities are sometimes put by these operations.

Scope and progress of the entire work.—The total surface to be treated as a work of public utility in the Alps, Pyrenees, and Cevennes, is estimated to amount to 1,035 square miles, in addition to about 1,900 linear miles of torrent beds. Up to the end of 1885, 152 square miles of this surface and 373 miles of torrent beds had been completed, the expenditures having amounted to £819,320, and the rates having varied from £3 2s. 6d. per acre, and from 2s. to 7s. 6d. per linear yard of torrent bed. There remain to be treated, therefore, about 883 square miles of surface, and 1,500 miles of torrent beds. In addition to the above, the State has paid £138,000, or half the cost of treating 212 square miles, as "permissive works," under the old law, and £12,000 toward pastoral improvements.

Draining and Planting of Swamps and Waste Lands.

Measures of the nature above described for the consolidation and protection of mountain slopes are undertaken in the interest of the population generally. In the case of sterile unproductive wastes or swamps, not requiring to be dealt with on these grounds, the government has thought it better, as a general rule, to leave each proprietor free to do what he considers most to his own advantage, confining it to the exemption from taxes for thirty years of all lands planted up. But the State has the right to force the communes to drain their swamps and wastes, with a view to rendering them suitable either for cultivation or for the growth of trees; and when this is done advances of funds may be made under certain conditions, one of which is that the commune has the right to surrender to the State, in satisfaction of all claims, a portion of the area not exceeding one-half.

The Dunes of the West Coast.

The winds that blow continually from the ocean on to the west coast, carry with them enormous quantities of sand, which, advancing steadily over the country at the rate of some fourteen feet per annum, in the form of moving hills called dunes, bury under them the fields and villages they reach. It has been calculated that nearly ninety cubic yards of sand per yard of coast line are thus annually transported inland. Works to arrest the destructive effects of this invasion of sand have been in progress since 1789; they were originally carried out under the Department of Public Works, but since 1862 they have been placed under the forest department. The total area of the dunes is said to be 224,154 acres, a part of which belongs to the State, and a part to private owners, while a much smaller portion is communal property.

In exposed situations the protective works consist of a wooden palisade, erected at a short distance above high-water mark, and destined to promote the formation of an artificial dune, with a view to prevent fresh arrivals of sand from being blown over the country. Under its shelter, seeds of various kinds, principally those of the maritime pine (*Pinus maritima*), broom, gorse, and gourbet (*Arunde arenaria*), are sown; and the seeds being covered with brush-wood to prevent the sand in which they are sown from moving, and the sowing is thus continued inland, in successive belts, until a crop of trees is raised on the entire area. In less exposed situations a wattled fence is substituted for the wooden palisades. In the Departments of Gironde and Landes, forests of the maritime pine have been most successfully raised in this manner, the trees being tapped for

resin, and the wood of those which have been exhausted being sold for railway sleepers and other purposes. But north of the Loire the maritime pine is not sown, as in that region it does not yield a sufficient quantity of resin to repay the cost of its introduction, and here it is sought merely to establish a crop of grass on the ground.

The law of 1810 relative to the treatment of the dunes, which is still in force, provides that the government can order the planting up of any area which in the public interest requires to be so dealt with. When the land or any part of it belongs to communes or private proprietors, who cannot or do not wish to undertake the work, the State can execute it, reimbursing itself with interest from the subsequent yield of the forests. As soon as the money so advanced has been recovered, the land is restored to the proprietors, who are bound to maintain the works in good condition, and not to fell any trees without sanction of the forest department. This system of raising forests on private lands would not be likely to succeed elsewhere; but here the extremely profitable cultivation of the maritime pine, due to the large quantity of valuable resin that it yields in the hot and moist climate of the south-west littoral coast, renders it a safe transaction for the State to engage in.

Before the forest department took over the work in 1862, 111,787 acres had been dealt with; and the entire area has now been completed. The works have to be most scrupulously maintained, in order to prevent a recurrence of the evil.

ADMINISTRATIVE ORGANIZATION AND DEPARTMENT STAFF.

Administrative Organization.—In order to carry out the work which has been briefly described in the preceding chapters, a corps of professional foresters, composed as follows, is maintained, viz.:—

1	Director of the forest department.	superior staff.
9	Inspectors-general.	
39	Conservators.	
245	Inspectors.	
234	Assistant-inspectors.	
308	Sub-assistant-inspectors (*gardes generaux*)	
3532	Brigadiers (head guards) and guards,	subordinate staff.

This body of officials is employed, partly in the ordinary duties of the department, as being in administrative, executive, or protective charge of the units into which the forests (including those of Algeria) are grouped, for their more effective and covenient control; partly in special branches, such as those which are charged with the preparation of working plans with the treatment of unstable mountains, and with the communal grazing arrangements; and partly also in the central offices at Paris. The following statement shows the number of officers of the superior staff employed on each kind of duty:

——	Director.	Inspectors-general.	Conservators.	Inspectors.	Assistant-inspectors.	Sub-assistant-inspectors.	Total.
Central offices	1	8	.....	10	12	2	33
Ordinary duties	.....	.....	35	180	177	209	601
Working-plans branch	.....	.....	.....	15	14	6	35
Consolidation of mountain slopes	.....	.....	.....	15	12	49	76
Communal grazing	.....	.....	.....	2	2	1	5
Schools	.....	1	1	3	6	.....	11*
Algeria	.....	.....	3	17	10	37	67
Detached duty	.....	.....	.....	3	1	4	8
Total on active list	1	9	39	245	234	308	836

* Exclusive of two forest officers who have been removed from the active list as professors and three professors who are not forest officers.

The Central Offices at Paris.

Since 1877 the forest department has been under the Minister of Agriculture instead of, as formerly, under the Minister of Finance. And the change has proved a most beneficial one; for the forests are now regarded more from the point of view of their utility in augmenting the general prosperity of the country, than from that of the money revenue they can be made to yield; and they are no longer looked upon as available for sale whenever the low state of the exchequer may seem to suggest this course, which was not seldom in olden days. The Minister of Agriculture is the president, and the director of the forest department is the vice-president, of a council of administration formed by the eight inspectors-general, which considers all questions submitted for the orders of government. The central office is divided into seven sections, each of which deals with certain branches of the work, and is presided over by an inspector-in-charge, who is assisted by two or three other forest officers and a number of clerks.

Ordinary duties in the forests.—The unit of administrative charge is the division (*inspection*) which is held by an inspector; but for purposes of executive management this charge is split up into sub-divisions (cantonments), under assistant or sub-assistant-inspectors, who are also at the disposal of the inspector for any special work that he may require of them. Occasionally, when the division is a small one, the inspector himself holds charge of a sub-division. The divisions are grouped into conservatorships, and these again into six circles (*regions*) each of the latter being assigned to an inspector-general. The forests, State and communal, managed by the forest department are 11,508 square miles in extent, and they are divided into 414 sub-divisions, 192 divisions, and thirty-five conservatorships; consequently, the average area of each of these charges is as follows, viz., sub-division, twenty-eight square miles; division, sixty square miles; conservatorship, 329 square miles. The average area of an inspector-general's circle extends over 1,918 square miles.

The sub-divisional officer is essentially an out-of-doors man, who personally directs all work going on within the limits of his charge, in accordance with the instructions given to him by the inspector, whose assistant he is, and who can at his discretion employ him on special duties outside his sub-division. The divisional officer is the manager of the forest estates. He prepares projects for the various

works that are to be undertaken, and directs the subordinate officers in their execution; he is also the prosecutor in all cases taken into court for the suppression of forest offences. The conservator exercises a general control over the divisional officers employed under him; and it is his duty to see that all work is directed in accordance with the views of the government, as they are from time to time communnicated to him from the central office. He alone has control of the expenditure, and has power to issue orders on the public treasury. As regards his circle, the inspector-general is not an administrative officer, but he makes an annual tour and is required to become personally acquainted with all the work going on, and with the qualifications of all ranks of officers employed within it, seeing that each fulfills his duties properly. During the remainder of the year he is at head-quarters, where he is able to make use at the council-board of the information collected during his tour, by advising the government both in the issue of orders for works and in the selection of officers and subordinates for promotion to fill the vacancies that may occur.

It may here be mentioned that in addition to the charge of the State and communal forests, the officers of the department are called upon to exercise certain functions in the private forests. which will be explained hereafter.

Working plans.—A separate branch of the department is charged with the framing of working plans for the most important forests, those for the smaller ones being prepared by the local officers. The thirty-five inspectors, assistant and sub-assistant-inspectors, who are thus employed, are divided into nineteen sections, which are at present working in twenty-four conservatorships. As the operations are concluded in one locality, the sections are moved to another. The officers are under the orders of the local conservator, who transmits their proposals to head-quarters with his own opinions and recommendations.

Consolidation of mountain slopes.—The branch of the department to which this vast undertaking is intrusted, is presided over by an inspector-general and is composed of seventy-six officers of the superior staff, working in eighteen centres. These officers are under the orders of the conservator within whose charge they are employed; and he transmits their projects and proposals to the inspector-general, who is thus enabled, by the exercise of his supervision, to utilize the experiences gained in the various localities for the benefit of the entire work. The inspector-general reports to the director of the department all matters relating to this undertaking which are to be laid before the council of administration.

Communal grazing arrangements.—The five officers who are employed in the three great mountain regions to prepare projects for the control of the communal grazing arrangements, and the issue of rewards for improvements to the pastures effected by the *fruitieres* (associations for cheese-making), are placed in the same relation to the conservators as are the officers employed on the consolidation of mountain slopes.

Accounts.—It is a fundamental principle of the French system of forest administration that the forest officers have nothing to do with either the receipt or the payment of money. They sell the produce by auction, or by the granting of permits, as the case may be; but the sums realized on account of such sales are paid by the purchasers directly into the public or communal treasury. The inspector prepares a budget estimate for his proposed expenditure on works, and when this has been sanctioned the various undertakings are commenced. Towards the end of each month he submits to the conservator an estimate of his proposed expenditure for the following month, during the last days of which that sum is paid to him, and he disburses it at once, transmitting the vouchers, together with the unexpended balance, should there be any, to the treasurer-general; he keeps

no money in his hands, In exceptional cases, however, the conservator can grant orders for advances to the officers employed under him; but in this case they must, at the end of each month, adjust the advance by vouchers handed in to the treasurer-general, along with any balance of cash that may remain unexpended in their hands. The treasurer-general thus keeps all accounts, both of receipts and expenditure of the department.

Departmental staff.—Members of the forest department are ineligible for any other office, either administrative or judicial; they are prohibited from engaging in trade, or in any industry connected with wood, and they must be regularly sworn in before they can enter upon the exercise of their functions.

They have as regards forest offences, the powers of police, including the right to make domiciliary visits for purposes of investigation and to arrest suspected persons; but these powers are exercised chiefly by the members of the surbordinate staff. Officers of the superior staff act as public prosecutors in forest cases.

Superior staff.—Candidates for the superior staff are, as a rule, trained at the national forest school at Nancy; but one-third of the appointments to the lowest grade (*Garde general*) are reserved for the promotion of deserving subordinates. A young forest officer on leaving the school is employed for a time, usually about a year, in learning his duties under an inspector; and his advancement from this probationary stage, as well as his further promotion through the higher grades depends on his own qualifications and exertions, as reported by his immediate superiors.

A promotion list is drawn out every year by the council of administration and published for general information. On it are inscribed the names of those officers of each grade who are considered to be the most deserving of immediate promotion, the number of names on the list being limited to three times the number of the anticipated vacancies.

The minister of agriculture makes all promotions up to and including the grade of inspector, but the conservators, the inspectors-general, and the director of the department are nominated by the president of the republic. No officer can, however, be selected for promotion whose name is not found on the list and who has not served at least two years in the lower grade.

The yearly pay of the various grades is as follows:

	£		£
Director of the forest department			800
Inspectors-general, three classes	480	to	600
Conservators, four classes	320	to	480
Inspectors, four classes	160	to	240
Assistant-inspectors, three classes	120	to	152
Sub-assistant-inspectors, three classes	80	to	104
Sub-assistant-inspectors, on probation			60

In addition to their salaries, the officers receive travelling allowances, usually a fixed sum per annum, at various rates according to local circumstances.

A pension, at a rate which varies according to the grade of the retiring officer, is obtainable after the age of sixty years; but no inspector can become a conservator after he has passed the age of fifty-five years. Conservators are usually pensioned at the age of sixty-two and inspectors-general at sixty-five.

Subordinate staff.—All members of the subordinate staff must have served in the army, and as a general rule, they must have attained the rank of non-commissioned officers; they cannot be less than twenty-five or more than thirty-five years of age at the time of their appointment. They receive their first nomination from the minister of agriculture, who promotes them from a list similar to that which is annually prepared for the superior staff. The scale of annual salaries

is as follows, viz., head guard, three classes, £36 to £44; guard, two classes, £28 and £30 with an additional £2 after fifteen years service.

They must live in or near the forests, where they are provided, as far as possible, with accommodations for themselves and their families in houses specially built for them; but if such houses are not available, they receive a lodging allowance. In addition to their pay, they are given a fixed quantity of firewood per annum and they are allowed to cultivate a plot of ground not exceeding two-and-one-half acres, and to graze two cows in the forest.

Each guard has a beat which he is bound to visit daily, the average size of such charge being about 1,200 to 1,300 acres, or say two square miles. The head guard has four or five guards under his orders: he superintends their work, and communicates to them the instructions received by him from the sub-divisional officer.

The duties of the subordinate staff are chiefly those of protection; they act as forest police, and have the power to serve summonses as well as to arrest delinquents. They are bound to report all offences committed within their beat: and should they fail to do so, they become responsible for the payment of any fines or compensation money which might be levied from the offenders. Acting under the orders of the sub-divisional officer, they superintend all work going on within the limits of their charge; and in addition to this they, under his direction, tend the young plants, prune the stems of the reserve trees, fill up small blanks in the forest, and perform such like minor operations with their own hands. Rewards are given annually to men who have specially exerted themselves in this manner; but they are forbidden to accept without special sanction, any gratuity from "communes" or private proprietors for services rendered by them in the execution of their duties. They are entitled to a pension when they have attained the age of fifty-five years, and have completed twenty-five years' service, including the time spent in the army.

As above stated, one-third of the appointments to the grade of sub-assistant-inspector are reserved for the promotion of deserving members of the subordinate staff. Ordinarily men so promoted must have at least fifteen years' service, and be less than fifty years of age; but they can be promoted after four years' service, if they have passed successfully through the secondary school at Barres.

Military Organization.—Under the law which provides that all men belonging, in time of peace, to regularly organized public services can in time of war, be formed into special corps, destined to serve with the active or with the territorial army, the members of the forest department form a part of the military forces of the country; and the officers of the superior and the subordinate staff are organized by conservatorships into companies or sections, according to their numerical strength. In case of the mobilization of the army, the forest corps is at the disposal of the war minister, and its various units assemble at previously determined points. The students of the forest school at Nancy receive military instruction and are drilled, the time passed at the school counting as service with the colors. The officers of the superior staff hold rank as officers of the reserve, or of the territorial army, and in time of war may be employed either in command of the companies and sections of the forest corps, or otherwise as may be ordered. From the day that they are called out, the companies form an integral part of the army and enjoy the same rights, honors, and rewards as the other troops which compose it. They are inspected by their own officers annually in time of peace, and the head guards, and guards who form the the non-commissioned officers and rank and file of the companies enjoy at all times certain privileges as soldiers.

In virtue of this service, a military uniform is prescribed for all grades, including the students at the schools. The subordinates wear it always; and the officers do so on all ceremonial occasions, including official inspections of the forests by their superiors.

FOREST SCHOOLS.—THE HIGHER SCHOOL AT NANCY.

The forest school at Nancy is the only one existing in France for the training of officers of the superior staff. It was founded in 1824, before which year the department was recruited either by means of young men, often of good families, who worked gratuitously in the inspectors' offices in the hope of ultimately obtaining an appointment, or by means of retired officers of the army. Very few forest officers received under the old system, a professional training sufficient to enable them to discharge their duties satisfactorily; and it was to remedy this state of things that the school was established. The arrangements were modest at first; but a great development has taken place during the sixty-two years that have elapsed since 1824. The present organization of the school will now be briefly described.

The controlling and teaching staff is composed as follows, viz.:—

1 director, with the rank of inspector-general (professor of political economy and forest statistics).
1 deputy-director (professor of forestry).
1 assistant professor of forestry.
1 inspector of studies (professor of law).
1 assistant-professor of law.
1 professor of natural history.
1 assistant-professor or natural history.
1 professor of applied mathematics.
1 assistant-professor of applied mathematics.
1 professor of agriculture.
1 professor of German.
1 professor of military science,
1 assistant-inspector for experiments.

All these are forest officers except the professors of agriculture, German, and military science; and none of them, except the professor of agriculture, who is dean of the faculty of science at Nancy, have any other duties.

The salary of the director rises from £360 to £480, with £80 a year sumptuary allowance. The professors of forestry, natural history, law, and applied mathematics, receive, on first appointment £80 a year in addition to the pay of their grade, whatever it may be; but if, after some years, they desire to be permanently attached to the school, they may be removed from the active list, on a salary rising from £280 to £360 a year, when they are entitled to a higher rate of pension than they would otherwise receive. The assistants take part in the instruction under the control and guidance of professors, whom they are in training to succeed; they receive £40 a year in addition to the pay of their grade. The salaries of the professors of agriculture, German, and military science are fixed from time to time, the maximum rate being £240. The appointment of deputy-director and inspector of studies do not entitle their holders to any extra pay; but these officers, as well as the director, have free quarters at the school. The staff is completed with an accountant, two adjutants (corresponding to sergeant-majors), a librarian, a gate-keeper, and other subordinates.

The director of the school is the president, and the professors and assistants are the members of a council of instruction, which assembles at the school from time to time to consider any matter which may be brought before it by the director.

A council sits at Paris at least once a year for the consideration of such general questions as may be brought before it, relative both to the instruction given at the forest schools at Nancy and Barres, and the conditions of admission to, and the regulations in force at, those institutions. President; the minister of agriculture: members; a senator, a member of the *conseil d'etat*, the director of the forest department, the director of agriculture, the agricultural hydraulics, and inspector-general of forests, the directors of the forest schools at Nancy and Barres, a conservator of forests, a retired forest officer, the director of the agronomic institute, a member of the national agricultural society, an inspector-general of mines, a chief engineer of naval construction, the professor of surveying from the military school, and an officer of the army.

Admission to the school is obtained by public competition. Candidates must be between the ages of eighteen and twenty-two years; they must be in sound health, and hold a certificate showing that they have completed their course of general studies at the *lycée* (high school). The subjects in which they are required to pass the entrance examination are as follows, viz.:

Arithmetic, elementary geometry, algebra, trigonometry, analytical geometry, descriptive geometry, natural philosophy, organic and inorganic chemistry, cosmography, mechanics, the German language, history, physical and political geography, and plan-drawing. Two passed students from the agronomic institute and two from the polytechnic school, can if otherwise qualified be admitted every year without further examination. The number of candidates admitted annually is, as a general rule, from fifteen to eighteen, and the course of study extends over two years, so that there are from about thirty to thirty-six regular students at the school at one time. The young men while at Nancy are housed in the school building, but take their meals in the town. Their parents deposit £60 a year for their maintenance including the purchase of books and instruments, but they do not pay anything for their instruction, or toward the annual expenses of the school, which may be estimated as follows, viz.:—

Salaries, scholarships, tours and examinations.....	£4,170
Maintenance of the buildings, library, museum, etc	742
Total annual payments by government	£4,912

If the number of students passed annually through the school be taken as sixteen and a-half, the actual expenditure per head, for the entire period of two years' residence is £298; but if interest at four per cent. on the estimated capital value of the buildings and collections (£22,000) be added, the annual expenditure becomes £5,702, and the amount spent by the State on each student during the period of his training is raised to about £350.

Each year of study at the school comprises six and a-half months of theoretical and two and a-half months of practical instruction; one month being devoted to examinations, and there being two months of vacation. During the period devoted to theoretical instruction, the following subjects are taught, viz.: First year, sylviculture in all its branches; botany, including vegetable anatomy and physiology, as well as the classification of plants and their geographical distribution, special attention being paid to forest trees and shrubs; political economy with special reference to forests; forest statistics; law, including forest laws and rules; together with such general knowledge of the common law of the

country as is judged necessary; surveying and the construction of roads; the German language; military science; riding. Second year, working-plans or schemes of forest management; mineralogy and geology, with special reference to the chemical and physical properties of forest soils; zoology, especially the branch relating to the insects which attack trees; agriculture; buildings, including houses, saw-mills and bridges; the treatment of torrent beds, including the construction of masonry and other weirs. The teaching of surveying, law, the German language, military science and riding is continued. During the last month of each theoretical course weekly excursions are made into the forest, but with the exception of this and the riding drill the whole of the instruction is given in the class rooms.

The practical course which occupies two-and-a-half months of each year, or five months in all, consists of tours made into the forests in the neighborhood of Nancy as well as into those of the Vosges and Jura, and occasionally to other localities for the purpose of studying forestry, natural history and surveying, a part of the time being devoted to military exercises. An area of 7,500 acres of forest situated near Nancy and placed under the director of the school is used as a field of practical instruction as well as for various experiments and researches, to carry out which an assistant-inspector is attached to the staff. The subjects dealt with by him are principally meterology, the growing of plants in nurseries, various methods of pruning, the effects of different systems of thinning, the rate of growth of various kinds of trees living under different conditions and many other things.

The school is well equiped in every way. Besides commodious buildings to accomodate the director, the deputy-director, the inspector of studies, the students, the adjutants, and other subordinates, there is a spacious amphitheatre with halls of study; a recreation room, and an infirmary are also provided. The museum contains very complete collections, illustrating the courses of mineralogy, geology, palæontology and botany, with woods, fruits, seeds and carefully arranged dried specimens of the foliage and flowers of trees and other plants, as well as raw forest products. There are also stuffed mammals, birds, reptiles and fish, and a collection of insects, with sections of wood showing the damage done by them to the trees. The school possesses an excellent professional library, comprising about 3,350 volumes and a number of maps. It has also a chemical laboratory, in which many interesting researches are made either at the instance of the professors or of forest officers of the ordinary service who may desire the investigation of questions which have arisen in the course of their work. There is a collection of models of saw-mills, of torrent beds treated with weirs, and of sand dunes, etc., as well as a fencing hall and a botanical garden. It is estimated that the buildings are worth about £12,000, and that the library and other collections are worth £10,000; total £22,000.

The students having passed out of the school at the end of their course of instruction are appointed to the forest department as *Gardes generaux* (sub-assistant-inspectors), and are employed on special duty for a time before being instructed with the charge of a sub-division.

Both Frenchmen and foreigners can obtain permission to follow the course of the school as "free students" without the payment of any fees. Since the foundation of the school in 1824, 1,334 regular students, candidates for the French forest service, have been received; and complete or partial training has been afforded to 239 free students of whom 30 were Frenchmen, 73 Englishmen and the remainder were foreigners of other countries.

The Englishmen are sent by the Secretary of State for India to be trained for the Indian service, under a special arrangement made with the French.

Government. Ordinarily the free students merely attend the lectures, and as a matter of course, are not examined; but the English students have to pass all the school examinations.

The Secondary and Primary Schools at Barres.

The secondary school was established in 1883, in order to train a class of men who should occupy an intermediate position between the officers of the superior and those of the subordinate staff. Of the students who entered in that year, seventeen passed out as head guards, and one of these has been promoted to the superior staff as a sub-assistant-inspector. But the school was reorganized in 1884, and it is now maintained in order to facilitate the entrance of subordinates into the superior staff, by completing the education of such of them as may be deemed otherwise fitted for advancement. Candidates for admission to the school are selected by the conservators from among those of their head guards and guards who are thought to possess the needful qualifications, and to be capable of passing the required educational tests; ordinarily, they must have completed four years' service in the forests, and be under thirty-five years of age, but passed students of the primary school can be admitted after two years' service in the forests. They are subjected to an entrance examination in the following subjects, viz., Dictation, elementary geometry, French history, French geography, timber measurement, the selection and marking of trees to be felled or reserved, and the duties of forest subordinates generally.

The director of the school is a conservator of forests, who receives the pay of his grade and free quarters; he is aided in the administration and teaching by two assistant-inspectors, each of whom receives an allowance of £40 a year in addition to his pay. Teachers who are not forest officers can be employed when their services are required. As is the case at Nancy, the director and the professors form a council of instruction and discipline. The students all hold the rank and wear the uniform of a head guard. They are lodged at the school, and receive an allowance of £2 a month to provide themselves with food and clothing.

The instruction, which extends over two years, is both general and special or technical; the object being to improve the general education of the students, and also to give them such a professional training, theoretical and practical, as may fit them for the position they are to occupy. The course is arranged as follows, viz.:—

First year,—Sylviculture, the cutting up and export of wood, estimates of quantity and value of timber, sales of forest produce, arithmetic and geometry, the elements of algebra and trigonometry, surveying and map drawing, levelling, forest law, the elements of forest botany, (including vegetable anatomy and physiology, and the classification of the principal forest trees), planting and sowing, and geography.

Second year,—Working plans, buildings and roads, the elements of mineralogy, geology, and zoology, the treatment of torrents and dunes, forest law and administration, the elements of inorganic chemistry, agriculture and agricultural chemistry, literature and the geography of France. Most of the above subjects are taught not only in the class room, but also practically in the forest. The school is established on a property purchased before 1873 for the primary school from M. Vilmorin, who had raised on it a large number of exotic trees of many kinds. There is also on the estate, a small forest treated as a coppice under standards, which, with the State forest of Montargis, situated at a short distance from the school, is used for the practical instruction of the students. The buildings comprise the residence of the director, the class-rooms, and students' quarters, as well as a museum, containing collections to illustrate the various courses of study.

The examinations are conducted before the director of the forest department, or an inspector-general deputed by him for this duty, and the students who pass will, under the new organization, be appointed to the superior staff as sub-assistant-inspectors. Like the officers trained at Nancy, they will be employed for about a year in learning their duties under an inspector, after which they will become eligible for further promotion on their merits, as are the other officers of the department. Subordinates from the communal forests are permitted to pass into the superior grades of the government service through this school. Nine students entered it during 1884 and 1885, and are still under instruction, eight of them having previously passed through the primary school. One free student followed the courses for a short time in 1883.

The primary school is a branch of the establishment at Barres, the instruction being given by the director and professors of the secondary school. It was established in 1878 for the training of young men who desired to enter the service of government as forest guards, or that of private proprietors as guards or wood managers, there being no restriction as regards their parentage. Up to the year 1883, 148 students had passed through it into the government service, and eight of these have since entered the secondary school. But in 1884 the primary school was reorganized, and it is now reserved solely for the education of the sons of forest officers and subordinates who may desire to enter the government service as forest guards, with a view in most cases, of their ultimately gaining the ranks of the superior staff through the secondary school.

Candidates must be between twenty-four and twenty-seven years of age; they must have completed their military service and be of good character, with a sound constitution. They are obliged to pass an entrance examination in dictation, French composition, arithmetic, elementary geometry, and French history and geography. While at school they are styled "Student-Guards"; quarters are provided for them, and they receive from government a part of their uniform, and an allowance of £1 16s. a month, to provide themselves with food and clothes.

The course occupies eleven months, and embraces the following subjects, viz.: Arithmetic, plane geometry, algebraical signs, surveying and levelling, the French language, French history and geography, the elements of sylviculture, the elements of forest botany (including vegetable anatomy, physiology, and the classification of the principal forest trees), and the elements of forest law, and administration. The instruction is given partly in the class rooms and partly in the form of practical work done in the forests.

Passed students are, as vacancies occur, admitted to the government service as forests guards of the second class; and after two years passed in the forests in that capacity they are eligible for entrance into the secondary school. During 1884 and 1885, however, only three students entered the primary school, two of whom are still there and one has received his appointment.

Free students can be admitted with the sanction in each case of the director of the forest department, but as yet none have entered the school.

THE PRIVATE WOODS AND FORESTS OF FRANCE.

Those woods and forests which are neither State nor communal property belong principally to private proprietors, of whom the number is very great, but also partly to civil, religious, commercial and other societies. Their extent varies of course from year to year, according as clearances are made for cultivation or planting work is undertaken. No very exact record of the area is available, but the latest figures show it to be 23,657 square miles, or about two-thirds

of the total wooded surface of France. It is probable that at the present time the private woodlands are being somewhat added to, rather than reduced, for it is believed that the areas annually planted up or sown exceed in extent those which are cleared. The private forests are not entirely free from State control; while at the same time they are protected by the legislation almost in the same manner and to the same extent as are the State and communal forests. For instance, private owners, in common with the government and the communes, enjoy the power to free their forests from wood-rights by making over a portion of the ground to the right-holders in lieu thereof. Grazing rights can only be exercised in those parts of them which are declared by the forest department to be out of danger from the entrance of cattle, and the number of animals can be limited with reference to the supply of grass, while no right can exist to graze sheep or goats in them. Owners have also the power to free their forests of all rights, except those of wood, by the payment of compensation; and speaking generally, it may be said that they have the same protection against injury to their property by right-holders as is enjoyed by the State and the communes. The law also places them in the same position as regards the punishment of forest offences, including trespass by persons carrying cutting tools, cattle trespass, and the lighting or carrying of fire in or near the forests, with a claim to damages for injury caused. Proprietors can obtain for their forest guards, if they have them regularly sworn in, the same powers for the protection of their property as are exercised by the State and communal guards.

On the other hand, private owners cannot cut down and clear their forests without notifying their intention to do so at least four months beforehand, and the forest department can, with certain exceptions, successfully oppose the clearance if the maintenance of the woods is desirable on any of the following grounds, viz.:—

1. To protect mountain slopes.
2. To protect the soil from erosion, and to prevent encroachments by rivers, streams or torrents.
3. To preserve springs and water-courses.
4. To protect coasts against the erosion by the sea and the encroachments of moving sand.
5. For the defence of the national frontier.
6. For sanitary reasons.

The minister of agriculture decides whether the clearance may be made or not. Between the years of 1828 and 1884 sanction has been accorded to the clearing of 1,795 square miles of private woodlands, but there is no record showing what proportion of this area has actually been cleared; and it is known that sanction is sometimes obtained merely to give an enchanced value to the property by the removal of restrictions on it. It is worthy of remark, however, that while the average area of which the clearance was annually authorized during the whole period above mentioned, amounted to 20,160 acres, the average during the last ten years was 5,404 acres, and during the last five years it was only 3,731 acres. These figures seem to show that woods are acquiring an increased value in France, and that they are cleared for cultivation to a less extent than formerly.

It has already been said that there is a special law relating to the forests of the Maures and Esterel, where fires are systematically lighted in order to get rid of the injurious undergrowth, and that under it private proprietors in those regions are only permitted to light forest fires at certain seasons, while they are compelled to cut fire-lines round all woods which are not completely cleared of inflammable shrubs.

The manner in which the laws relating to the consolidation of mountain slopes and the planting of the dunes affect private owners has also been briefly explained in a previous chapter.

What has already been said regarding the systems of culture generally adopted for the State and communal forests respectively, will lead to the correct conclusion that those belonging to private owners are, as a rule, treated as simple coppice, or coppice under standards, private high forests being usually composed of coniferous trees, and situated in mountainous regions. But many of the forests that have been planted in the plains of the Landes, Salogne and Champagne are stocked with coniferous species, which are frequently more suited to the local conditions, under which they yield a better revenue than could be derived from other kinds of trees. Notwithstanding that the private forests are, as a rule, more favourably situated than those owned by the state or by communes, the gross revenue per acre derived from them is considerably less; because the trees, being cut down at a young age, yield a large proportion of timber of a small size and firewood. On the other hand, their capital value is less, and when they are properly managed they should give a higher rate of interest.

But, unfortunately, although there are exceptions to the general rule, and some of the private forests are maintained in an excellent condition, it cannot be said that, generally speaking, they are so. For while coppice, and particularly simple coppice, is exhausting to the soil, from the young age at which the crop is cut and removed, and, in consequence of the comparative frequency with which the ground is denuded, tends to its physical deterioration, working plans are rarely prepared, and there is consequently no guarantee that the cuttings are confined within proper limits. The fellings are, in fact, too frequently regulated according to the financial requirements of the owner, rather than by the considerations which ought to govern such operations; and hence it follows that the condition of the private forests is not always such as could be desired. This is found to be the case in all countries; but it is probably especially so in France, where the laws relating to the division of the land on the death of its owner, and the custom of the country tend constantly to diminish the number of large properties, and to leave in the hands of each proprietor an area of woodland too small to admit of its management on a regular system.

The produce derived from the private forests is, however, large in amount, and of very great value. Exact figures are not obtainable; but it is probable that the 26,657 square miles yield annually over 12,000,000 loads (of 50 cubic feet) of wood, with about 270,000 tons of tanning bark, 2,250 tons of cork bark, and 30,000 tons of resin—worth altogether, more than £6,000,000; while the isolated trees and vines yield another three and a half million loads of wood, valued at £1,000,000. The number of foresters and guards employed in these forests, is, however, comparatively speaking, very limited; this being due, in a great measure, to the small size of the individual properties, which are consequently in a very large number of cases, managed directly by their owners. There are no private institutions for the training of foresters and woodmen; and although the State forest schools are open to receive "free students" very little advantage is taken of this privilege. The Nancy school has only trained thirty such students since it was established in 1824, and the secondary and primary schools have only received one student between them. Neither the owners, nor their managers or guards, have then, as a rule, had any professional education, notwithstanding that the means of obtaining it is open to them; and it is not to be wondered at if grave mistakes in the management of their forests are of frequent occurrence. In some places they have the means of getting a certain amount of advice from the State forest officials, who are occasionally

permitted to render assistance in this manner; but they frequently attempt to imitate what is being done in the State forests, without knowing the reasons for what they see; and they are thus led to commit serious mistakes, as, for example, when, in treating a forest which is to be permanently maintained as coppice under standards, they follow the procedure adopted in a neighboring State forest which is undergoing conversion into high forest. In many cases, of course, the private woods are too distant from the State or communal forests to permit of their owners obtaining any advice or assistance from the officials of the forest department, and they are then thrown entirely on their own resources.

THE TIMBER RESOURCES AND TIMBER TRADE OF CANADA.*

From the geographical position of Canada and the United States, and the natural and artificial routes of transportation that exist along the line, and across the boundary between them, it is reasonable to expect that the interests of trade will, in the future as in the past, draw from the timber resources of both countries for their respective wants, so long as either of them has these commodities to supply Besides this common interest in the forests, for meeting the demand for consumption, both countries have, for a long period, been competitors in the foreign lumber and timber trade, and have shared alike in the vicissitudes that have attended it.

It therefore appears proper to present in connection with the statistics already given concerning our foreign commerce in forest products, as full information as can be derived from official and trustworthy sources, as to the nature and extent of this business in Canada, extending back to the date of the present Dominion Government, and in some instances to an earlier period. The series of tables that we present will sufficiently represent the tendencies of the trade during the years they embrace, and its extent as compared one Province with another, and in different years.

The great prominence of the timber interest of Canada has in recent years led to thoughtful inquiries into the extent of these resources, a synopsis of which will be first presented.

Inquiries concerning the Timber Interests of Canada.

A Select Standing Committee on Immigration and Colonization, appointed by the Dominion Parliament, has at recent sessions thought proper to institute inquiries having reference to the condition of the forests of the country, and the extent, value, and prospects of the lumber trade. The chairman in the session of 1878, (Mr. James Trow,) in introducing the subject remarked:

That the actual condition of the timber supply of the Dominion was a subject of the utmost importance, and one that deserved the special attention of the committee. It involved not merely the prosperity of the greatest of the manufacturing industries of the country, and the main staple of its foreign commerce, but exercised also a controlling influence in regulating the extent of future settlements, in as much as the forests tempered the climate by rendering it more equable—maintained the regular flow in rivers by preventing inundations, and furnished new settlements with the cheapest building material and fuel.

Mr. Stewart Thayne, an English journalist of some years' experience, who had for the last five years been engaged in researches having reference to the lumber interest, and who had been for two and a half years exclusively engaged in studying this subject of timber resources in Canada, appeared before the committee, and gave in substance the following information:—

"The advantages which Great Britain derives from the Canadian supply of timber are numerous, the principal being:—

1. The best quality of Canadian pine is the most valued of the soft woods used in the United Kingdom.

2. The dimensions of the soft woods shipped from Canada are larger than can be procured from the timber-producing countries of Europe

*F. B. Hough: Report upon Forestry (U. S.) 1878-79.

3. The colonial supply maintains a healthy competition in the trade, decidedly favorable to the interests of the British consumers.

This trade affords employment for a large amount of British and colonial tonnage.

The kinds of wood exported are, among the hard woods, oak, elm, ash, birch, etc., and of soft woods, the white and red pine, and spruce.

"The dimensions now exported are less than formerly. It was quite usual for the square-timber shipped from the St. Lawrence about thirty years ago to average from 70 to 75 cubic feet per log, whereas, at the present day, the average of the season's log crop does not range beyond 55 cubic feet. Then, in regard to the quality, it was no unusual thing at the period just referred to, for the pine rafts to yield from 70 to 80 per cent., of first quality of wood. I think it would be within the mark to state that the pine at present sent to the Quebec market does not furnish 20 per cent, of first quality. About two years ago I took the trouble to ascertain the qualities of the stock wintering at Quebec, and the estimate I then found was lower than the one just quoted; indeed, the deals, in my opinion, did not show 15 per cent. Perhaps however, some allowance should be made for the fact that this stock was that which was left after the season's shipments.

"The quantity of lumber that passes through the lakes and down the St. Lawrence is comparatively small, and I am not of opinion that it is all of the first quality. The British Board of Trade returns estimate the value of the Canadian wood imported during the year 1877 as something like $26,000,000. The total imports of hewn timber, during the year, amounted to 103,980,650 cubic feet, of which quantity British North America furnishes 24,286,000 or a little less than one-fourth. This included every description of wood not sawn or split. Of sawn wood there was imported during the same period 228,637,400 feet, of which the Dominion supplied 62,810,600 cubic feet. So that in rough numbers it may be said that Canada supplied the United Kingdom with one-fourth of its timber imports. The total estimated value of these imports, exclusive of furniture wood, is set down at £19,705,447, and the value of the Canadian goods at £5,500,000 sterling. It may be gathered from these figures that a higher value is given to the Canadian produce than to that received from other countries.

"In respect to the present timber trade of Canada, as compared with that of thirty or forty years ago, there is a very great difference in the proportion. For instance, in the year 1831 the total importation of hewn wood into Great Britain amounted to 28,109,950 cubic feet, and of this quantity 20,943,950 cubic feet were sent from British North America.

"In 1832, 1833, 1834 and indeed up to 1840, Canadian shipments held their position; the total quantity imported by Great Britain is gradually increasing, but the exports from this country do not bear the same ratio to the general trade. Thus in the latter year, the total importation of hewn wood reached 40,858,150 cubic feet of which Canada contributed 32,497,650.

"The square timber trade of Canada held its position in the English market up to the change in the tariff, during Sir Robert Peel's administration. The immediate result of the reduction of the duty on foreign wood was to increase the importation of the latter very considerably, during the years 1845, 1846, 1847 and 1848. During these years the exports from Canada increased also, but not in the same ratio as the foreign. In 1850, the figures representing the then volume of trade are as follows: Total imports of hewn wood, 43,408,950 cubic feet; from Canada, 30,901,950 cubic feet; sawn wood, total, 39,708,900 cubic feet; from Canada, 21,740,900 cubic feet.

"The following table shows the expansion of the trade in recent years, the quantities being cubic feet:

	Hewn wood.	Sawn wood.
1872 Total imports	89,131,650	154,167,450
From British North America	22,174,200	39,414,400
(Percentage from British North America)	24.7	25.6
1873 Total imports	103,569,500	170,786,150
From British North America)	18,293,750	47,717,800
(Percentage from British North America)	17.6	27.9
1874 Total imports	122,369,700	190,262,350
From British North America	23,818,750	53,809,400
(Percentage from British North America)	19.5	28.3
1875 Total imports	84,396,950	164,891,500
From British North America	16,843,350	47,661,400
(Percentage from British North America)	19.9	28.9
1876 Total imports	107,914,750	205,130,900
From British North America	23,527,450	55,367,350
Percentage from British North America)	21.8	27.0
1877 Total imports	103,980,650	228,637,400
From British North America	24,286,000	62,810,600
(Percentage From British North America)	23.3	27.4

"All the timber-producing countries of Europe have participated in furnishing these immense supplies of wood; but the most notable increase apparent, during the past few years, has taken place in the quantities of pitch-pine imported from the Southern States. A few years back the demand for this wood in England was limited, being used only for a few special purposes. Immense quantities have been shipped to Europe during the last few years, and, having been sent on speculation, it was sold frequently at very low prices, in some cases at rates that did not cover the freight and expenses, hence it has been introduced into many districts where it was formerly unknown, and competes with the lower grades of Canadian pine, but more particularly with the red pine.

"Sweden and Norway supplied the United Kingdom with from 4,000,000 to 6,000,000 cubic feet of hewn wood during the last few years more than Canada.

"But a very large proportion of the goods under this heading consists of pit-props, and spars, and other small wood of little value. In the matter of sawn wood, these countries furnish Great Britain with some twenty or twenty-five million cubic feet more than the Dominion. The best Swedish deals do not compete with the best quality of Canadian pine, but find a readier sale than the second and third qualities of the latter.

"This trade must be of great value to the shipping interests of Canada and Great Britain, but I have no means of ascertaining the exact number and tonnage

of the vessels engaged in this trade during the last few years. The quantity of timber shipped to the British Islands alone must require a carrying capacity of something like 1,500,000 tons. The timber carrying of Europe is confined almost exclusively to foreign bottoms, and though these latter figure largely also in the colonial trade, still British shipping finds in it a source of profit, particularly since the construction of so many new iron vessels has deprived the wooden ones of the carriage of much valuable freight over long sea voyages. Another advantage the shipping interest derives from this trade is the fact that the vessels can be employed in it for a longer period than in almost any other.

"As a matter of fact, there is no other soft wood imported into Great Britain that finds more favor, or that can command a higher price than the first quality of Canadian pine. The consumption is increasing (as shown by the figures above quoted,) at a rapid rate. In 1831 the import of hewn timber amounted to 28,000,000 cubic feet, while in 1877 it exceeded 100,000,000 cubic feet. The increase in the import of sawn wood is still more extraordinary. The trade has never ceased to expand. No doubt the annual returns show occasionally very serious reductions in the quanties imported. The timber trade has experienced seasons of depression, but they have always followed periods of inflation. Such vicissitudes are inevitable in any branch of commerce where the speculative element has full play. The averages for any given series of years prove, however, that the consumption has advanced with remarkable regularity.

"The common pine and spruce from Canada are used in England for general purposes, but the best quality of pine is now extensively employed in the finishing work of the higher class of dwelling-houses. This wood, when very clear and soft, commands a high price among engineers, metal founders, etc. Its advantages are: that it is easy to obtain a remarkably smooth surface, and the wood is susceptible of being worked to the highest degree of finish, and to the finest edge, without the risk of chipping or breaking like other woods, rendering it very useful to moulders, and I understand that the quantity purchased by them for this purpose is very considerable.

"As to its preference over other woods for finishing purposes I should consider, judging from its frequent appearance in architects' specifications—that it is a favorite wood with the profession, but its merits are so transparent that I do not consider this surprising. No doubt very strong prejudices existed against Canadian wood in England at one time. A constructor of the royal navy stated before a parliamentary committee that a ship constructed of colonial timber could not be depended on for more than twelve months on accounts of its partiality to the dry-rot. Builders came forward on the same occasion to allege that a house having a covered beam of Canadian pine was dangerous to human life, because it might cave in at any moment, while there were some who did not hesitate to maintain that a building containing any portion of this despised wood would speedily become uninhabitable owing to its tendency to breed bugs. One gentleman who boasted of his experience, said that the pine in its native woods harbored myriads of these insects; that they might be seen swarming the logs at Quebec; that they infested the ships that brought this kind of timber to Europe, and finally thronged the woodyards of Liverpool."

To an inquiry as to the quantity of first quality of pine now at Quebec, as compared with that of former years, Mr. Thayne replied: "I saw only a small proportion of the stock that could be considered first quality, and should imagine,

therefore, that it must be much less than in former years. By quality, I mean not the size but the texture of the wood."*

In answer to the question as to why the importation of timber into England from Canada had fallen off, it was replied: "I imagine that the reason why the export of square timber from Canada has not kept pace with the home demand, is your inability to supply the description of it that is most particularly wanted. I think also that your profits have diminished because so much of your timber is of poor quality. I think it is safe to contend that the reason why more of your best pine is not purchased is that it cannot be had, and I fear that your power of producing it is not likely to flood the home markets.†

"No doubt there is still some excellent timber in Canada. What I have been attempting to explain is, that however good the produce of certain sections may be, or however well some portion of the present supply may compare with that of former years, still the total quantity of such wood brought to market is small when compared with that of former years, perhaps not one-fifth of a season's manufacture."

With respect to the probable duration of timber supply, at the present rate of consumption, exportation, and waste, Mr. Thayne did not like to give a definite opinion for the following reasons:—

1. Because he could not find data sufficiently reliable to guide him to a safe conclusion;

2. Any calculation that would ignore the quantity of young timber standing in the woods, but which may become available in the course of twenty or thirty years, would rest on an unsound basis; and,

3. Because there are so many sections of timber-producing land in these Provinces which, though not extensive when considered separately, still form, in the aggregate, no mean source of supply, and which, though now lost sight of, would soon be opened up, provided a profitable demand should spring up. Having made this statement, he added: "I feel bound to say that every test I have applied to ascertain the quantity of merchantable timber actually standing in any section of the country has convinced me that the resources available are much smaller than public opinion supposes them, particularly those woods adapted to the export trade."

In reply to a member, the witness said:—"No doubt the duration of the timber supply of the United States is a point of much interest to this country. Any interruption of the supplies now drawn by the eastern States from the west would at once compel the former to resort to your markets. Under such circumstances it is easy to foresee that Canadian lumbermen would seek an outlet nearer home for their produce. It would, moreover, be easy for the New England dealer to compete with the English buyer, burdened, as the latter will always be, by a heavy ocean freight."

* To this statement Mr. Cockburn, a member of the committee said: "I must join issue with you on this point, as the quality we are getting now is very fine. In fact, I believe that the soft pine now is of better quality than that formerly dealt with. The pine growing in the free grant lands, or in Northern Ontario, meets with a very ready sale. The quality is found by experience to be very fine. At one time it was supposed to be very inferior, but happily, experience has shown it is of a very superior quality, although not so large. Though smaller it can take its place beside the larger Michigan pine." Another member remarked that formerly the difference in price between first quality and fair average was less than now, but that at present regard is had, not so much to size as to quality, a small log being sometimes worth more than a large one.

† It was here remarked, by a member, that large pines came from Michigan, up to 22 inches. Good pines were obtained from Laurentian range region of Ontario, of a size that only goes to 18 or 19 inches, strong and clear, which sells as fast or faster than the Michigan, though smaller. Another member remarked that the texture of Canadian wood is not so open as the American; it is closer in grain. But we should bear in mind that these woods, although competing favorably with Michigan timber of the present day, do not compare with the larger timber produced in Canada some years ago. We produced as good a quality of a larger size, fifteen years ago.

With respect to principal lumbering districts, the Ottawa valley, so far as the export trade is concerned, was by far the most productive, the area drained by the Ottawa and its branches being about 8,000 square miles. Over four-fifths of the square white pine shipped to the United Kingdom is manufactured in this valley.

The chairman remarked that altogether the average area of timber lands in the Dominion is about 280,000 square miles, The river Saguenay and St. Maurice drain large regions extensively timbered.

Great Britain imports masts and spars from Puget Sound, and some splendid pine boards from British Columbia find their way to the workshops of furniture manufactories in London; but the cost of freight is so great that it will effectually preclude importation from that quarter on a large scale. There is not sufficient freight outward to occupy a small fleet, and the journey is too long and costly to entice vessels merely for a return cargo.

Of the $30,000,000 to $35,000,000 worth of soft woods imported annually by France during the five years preceeding the late war, only a very small proportion was obtained from Canada—a few cargoes of spruce and red pine. The French do not seem to value the white pine. This may arise from the fact that the native hard woods are used very extensively in household construction. Of birch, a very fair quantity enters into consumption in England, large shipments being made from the Maritime Provinces.

It has been computed that the lumber trade of the Ottawa valley alone affords employment to upwards of 25,000 men.

In regard to the duration of timber supply in the north of Europe, a definite answer could not be given. Russia is credited with a large forest area, that might be made available by railroads. Austria likewise possesses some magnificent forests in the centre of Europe, which can only be reached by similar means. Whether so bulky an article as timber can bear the expense that such transportation in Europe would involve, can only be decided by experience. It is true that the European governments are beginning to show a great deal of interest in protecting the forests; but this newly awakened feeling does not owe its existence entirely to any desire to promote the exportation of forest products, but rather to the fact that they are alarmed at the injuries sustained by the arable land consequent on stripping the hills and river banks of their wood.

With respect to the waste attending the system of leasing limits, by selecting the best logs and allowing a large portion of the trees to rot in the woods, it was deemed to have been greater formerly than at present, the present tenure of these leases being looked upon as so secure that no apprehension of arbitrary interference on the part of the government is now entertained. There is, of course, great waste in the manufacture of square timber, as one-fourth of the best part of the tree was left in the woods in the form of chips. The present system of imposing dues does not present an inducement to waste, but there was a time when a sort of premium was paid for cutting only the largest size of timber because the dues were the same on the smallest sticks as on the largest. At the time referred to, the dues were computed by the piece, red pine at thirty feet average, and white at seventy feet, and the object of the lumberman was, consequently, to cut sticks as large as he could.

With respect to the replanting of denuded timber lands, the witness replied to an inquiry touching the feasibility of the measure, as follows:—

"It is difficult to understand how some steps in this direction have not been taken. In the Provinces of Ontario and Quebec, the local governments derive a handsome revenue from the timber-lands, and yet they seem to regard their disappearance with perfect indifference. Every tree that is felled contributes to

their exchequers, still millions have been destroyed by fire without exciting the least effort to prevent such wholesale destruction. These Provinces are spoken of as the future home of millions of people, and yet there is no foresight displayed in reserving, for their use, such indispensable necessaries as cheap building material and fuel. In these two Provinces there exists an immense area that will never be fit for settlement, but which, if judiciously managed, would place Canada in the front rank as a timber-producing country, thereby affording constant employment to a large section of the population, and supporting both commercial and shipping interests. To attain these results, it is neither necessary to injure or disturb such vested rights as have been acquired, nor to adopt very extraordinary or costly expedients.

"Either to lease such lands for long terms, on condition of keeping up the supply, and restricting the cut according to the growth and species of timber on the limit, or by resuming possession of those lands which have been cleared of their pine, and placing them under the charge of practical foresters, replace the pines by varieties that would repay the cost of culture. I am aware that the mere mention of forest-culture seems something far fetched and impracticable to Canadian ears, but that does not alter the fact that, of all descriptions of cultivation, it is the most profitable. When, further, in a country like this, it becomes a question of utilizing a territory not adapted to any other purposes, and which otherwise must remain barren and unproductive, there should be no hesitation respecting the course to be pursued.

"It is, no doubt, very unfortunate that a line of policy, which is calculated to stir up some grumbling and opposition, and of which the advantages can scarcely be fully appreciated for one or two generations, is not likely to enlist the sympathy of politicians, but this very reason should decide a patriotic statesman to undertake it with determination."

The opinion was expressed that white pine, valuable as it is, would scarcely pay to cultivate. By preserving the young trees, it may still last for a number of years, particularly as there is not much likelihood that the soil which it occupies will be required for other puposes. It requires something near a hundred and fifty years to attain maturity. It was remarked that of late years experiments made in various countries having widely different climates have established the fact that trees may be successfully grown in regions far removed from their original *habitat*, and can already compare favorably with those of mature growth.

There is, therefore, no reason why similar results should not be attained in this country.

The Eucalyptus, an Australian gum-tree, was mentioned as an illustration of this fact, it having been found to thrive remarkably well in the south of France, in Algeria, Hindostan, and California, but it would not survive the winters of Canada.

As to the appointment of inspectors of forests, to report on the timber, and enforce the laws for prevention of forest fires, it is said:—

"The appointment of such a staff would supply one of the most urgent needs of the country—the prevention of forest fires. If it were generally understood that the lowest estimate of the average annual loss through the forest fires, places it at $5,000,000 in the Ottawa valley alone, it appears to me that public opinion would soon interfere to prevent such a fearful waste of the national wealth, for it should be remembered that in the great majority of cases these fires originate in causes that could be easily controlled. But that the country should derive the fullest benefit from the services of such a corps, it is necessary that these inspectors should be practical foresters, of high education and ample experience in the best training schools of Europe. It would be comparatively easy to secure the services

of such a class, who, when once established in the country, could train their assistants. Officers of this stamp would, in the course of a few years, be in a position to furnish the government employing them with such information as would render the inauguration of a sound forest policy comparatively easy. It may be objected that this plan would involve considerable expense, but what would the heaviest outlay under this head amount to after all, but an infinitesimal premium of insurance against the average annual loss sustained through these fires, leaving all other considerations out of sight."

To the question as to whether it would be deemed arbitrary on the part of government to make it imperative upon the settlers to plant a certain number of trees on their homesteads, it was replied: "I would consider such a provision one suggested by ordinary prudence. In the treeless districts these plantations would insure a continual supply of fuel, and afford shelter to the land. And here again the necessity of practical foresters in a district makes itself apparent. In order that the settler may derive the fullest benefit of such woodlands, the trees should be planted in positions where they would be of real service to the arable land. I would go even further in suggesting that where new town lands were laid out for settlement, the position to be occupied by the plantation should be selected in such manner as to afford protection to the more exposed districts. The newcomer should also be advised as to the description of timber best adapted to the soil, etc."

Returning to the subject of the difficulty of raising white pine, the question was raised as to whether it would not be advantageous to replant sections of the country with spruce—a rapid-growing timber—the witness said: "Most decidedly. I imagine however that it would be only in rare instances where it would be necessary to incur the expense of planting; regulations providing for the proper protection of the young trees would answer the purpose in view. At the same time the government should offer inducements, either to farmers or limit-holders, to devote a small portion of their lands to the cultivation of both native and foreign trees, and ascertain from time to time the rate of growth, etc. The government should provide either the seeds or saplings upon which the experiments were to be made."

A member remarked that in the spruce country, by ten or fifteen years, you would get quite a good crop; but it would take a long time to grow trees from the seed. When eight or ten inches in diameter let them stand ten or fifteen years, and they will yield good cutting timber.

Spruce is used in England in very large quantities. The Maritime Provinces, the Gulf ports and the lower St. Lawrence ship a very considerable amount. Norway is the principal source of the European supply of this wood, but it is a very small size, battens 6½ inches wide and boards as narrow as 5 inches.

A considerable portion of the trade between the north of Europe and Great Britain is in the shape of manufactured goods—flooring boards, window sashes, doors, mouldings, frames, etc. There are many obstacles to the successful prosecution of this trade with respect to Canada. In the first place the manufactured goods imported from the north of Europe are used principally in the construction of the inferior class of houses, and of factories, warehouses, etc. These manufactures are cheap; orders for them can be speedily executed, and can be forwarded with dispatch at a moderate rate of freight to all the principal ports of Great Britain; such as are consigned for sale are also sold at very low prices, labor being cheap in those countries, and the mills close to the seaboard. On the other hand the builders of first-class houses in which Canadian lumber is probably used, have their orders carried out under their own supervision, and were it otherwise the time necessary to forward orders, the delay that might attend their expedition to

any but one or two ports, and above all the short season of open navigation, are so many obstacles in the path of the Canadian manufacturer.

It might be added to the foregoing that English dwellings of the best class are not constructed with so much uniformity of style as they are on this side of the Atlantic. An enterprising firm might, no doubt, surmount some of these difficulties by establishing a depot for the sale of its goods, and forwarding a plentiful supply of stock during the summer season; or, better still, appoint as agents in Europe firms of high standing in the trade, likely to be able to dispose of large consignments. But to succeed it would be necessary to possess enterprise, capital, and an intimate acquaintance with the details of English building operations.

As to hemlock, it was thought that when pine becomes more scarce and costly it would come into demand. If its peculiar qualities were as well known in Europe as in the United States, it would be generally used there also for the flooring of large warehouses, particularly where grain is stored.

"In respect to fires, forests in Europe are differently situated from those in this country. They are not in such unbroken stretches as they are here. Except in parts of Russia and the north of Sweden, there are numerous villages scattered through them. Most of the inhabitants of those villages are employed in the forests, either as charcoal-burners or otherwise. Every forest of any extent has its regular staff of officers and rangers, whose special duty it is to watch over its safety. Open spaces and broad belts of cleared land are kept up on purpose to prevent fire from spreading. The ground is not encumbered with such quantities of *debris* as is usual in this country. There are no inexperienced settlers, no reckless workmen, and no careless hunters at hand to court the ravages of this destructive element. The people employed in the forests are interested in their preservation, and stringent police regulations control all others. Notwithstanding all these precautions, fires do occasionally occur; but of late years they are becoming rare, and on a smaller scale. Probably very few fires occur from lightning, as it is almost invariably accompanied by heavy rain-storms and if a fire should occur from lightning the rain would almost invariably put it out. Inquiries directed to this point had resulted in tracing two great fires in the Ottawa Valley to lightning, but they occurred some time ago."

The question of the influence of forests upon the climate of the country and of the effect of clearings being raised, Mr. Thayne replied: "I have endeavored to obtain information upon this point, but without results that would enable me to form a definite opinion. Unfortunately such meteorological observations as have been registered were made at points too far from the influence of forests to be able to denote any but the most trivial changes during the comparatively short period that the subject has received attention. These observations, to be of real use for the purposes referred to, should be made at many points scattered over a wide area. There can be little doubt that the clearings made by the settlers, and more particularly by the forest fires, must already begin to exercise a certain amount of influence on the climate of this portion of the Ottawa Valley. Still, the total absence of any observations at or above this point renders it impossible to express any opinion on the subject."

The effect of planting upon the prairies being referred to, its importance was urged in the strongest terms: "In the various accounts I have read of the prairie land of the North-west, I find frequent mention of the sudden changes of temperature. Severe frosts occur sometimes after the crops have been sown, and again before they have been reaped; or the temperature of the night is often much lower than that of the day. Then these plains are exposed to violent tempests through the cold currents of the Arctic regions coming into contact

with the heated ones of the plains. To ameliorate a climate presenting such contrasts there is only one method—that of planting wherever the nature of soil will permit it, and forming the settlements under the shelter of these plantations. Of so great importance is this to our western country that, in my opinion, upon its solution depends whether that region will realize the sanguine expectations now entertained of its being able to support an immense population ; or whether, after many sore disappointments, perhaps, it will deserve the name of the Lone Land. If some of the most fertile regions of the earth have been reduced to the condition of sterile wastes through the destruction of their wooded lands, I think it not unreasonable to infer that a country exposed to a severe climate cannot continue to be productive when, instead of being vigorously planted its already scanty stock of timber is further encroached upon by the new settlers."

The inquiry being raised as to whether a reduction in the amount of exports would not tend to enhance prices, and thus bring increased profits to the business, the opinion was expressed that any further reduction in the export of the first quality of pine would make it so scarce that its sale would be restricted to a few markets of England, and a substitute would be found for it in many quarters where it is now used. The best means of preventing fluctuations in the market would be to export no more than experience had proved to be a fair average demand. So long as lumbermen manufactured in defiance of every law that should regulate the rate of supply, they must take the chances as to the prices which their goods will fetch in the foreign markets.

With regard to the demand of timber for ship-building, a tendency had been observed towards its decline, sailing vessels being superseded by iron steamships, in the carriage of all the costlier and finer classes of merchandise.

In reference to some remarks on the lumber and ship building trade of Prince Edward Island, a member stated : "We import some of our large beams used in ship-building, for keelsons, etc., from Quebec; they are of pine and tamarac. We build our vessels of a class just about the same as our juniper vessels formerly. We can class from seven to nine years. We own vessels in Prince Edward Island, and can produce them cheaper than in Quebec. We find that wooden ships are taking the place of iron ships, and derive a great advantage from the fact."

In a report of a similar committee upon immigration and colonization, made in 1879, in considering the capabilities and prospects of the north-western regions of the Dominion of Canada, the following answer was given by Mr. Thayne to the question as to how the present growth of wood might be maintained, so as to prevent its exhaustion:

"By a system very different to the one pursued in the older Provinces of the Dominion, where the forest lands have been treated without due regard either for present purposes or for the future wants of the country. Here, however, the opinion was universal that the timber was inexhaustible, and that its destruction was advantageous to the country. It is only of late years that the fallacy of this belief has been brought home to the minds of those who have examined the matter. In the North-west the case is very different; no competent authority affects to maintain that the timber supply is equal to the wants of such a population as the fertile lands might be expected to support. The obvious policy of the government would, therefore, be to have the timber-producing regions surveyed at the earliest date, before any vested interests are created, and set apart permanent reserves wherever the adjacent lands require shelter, or where a large population is likely to settle. These reserves should be under the direct control of the government, who might either lease them, subject to the condition that the lessee should maintain a regular supply or, better still,

according to the system followed in the state forests of Northern Europe, a certain proportion of full-grown timber should be disposed of by public competition the trees to be removed by the purchasers, the number being regulated by the requirements of the locality and the yield of the reserve."

To the question as to what would be the probable effect on the prairies of the North-west if the settlers were under obligation to plant a certain number of acres of trees about their farms, it was replied that no provision would be likely to be of such general advantage, nor one better calculated to promote the welfare of the inhabitants, but under existing circumstances such a proposal was hardly practicable. It would be unreasonable to expect that an immigrant should know what plants would thrive on the soil he occupied. Very few settlers, indeed, are likely to have any experience in arboriculture, and with the great majority it is only too probable that the struggle for existence during the first years of their occupancy would preclude experiments involving any additional outlay of money or labor. To impose such an obligation on the colonist, it would be incumbent on the government to provide him with the means of fulfilling it, and this could be done only by establishing nurseries in the treeless sections, whence the seedlings adapted to the locality might be distributed, either gratuitously, or at a very low price, with the needful instructions for their cultivation. These nurseries might be owned by the government or their formation encouraged by grants in aid to county or municipal authorities or associations.

In reference to the maintenance of supplies in the north of Europe, Mr. Thayne replied that where the supply is limited, as in Germany, the laws are very stringent in some States, going so far as to prevent lands once under forest being devoted permanently to any other purpose; in others, again, private landholders have been probibited from felling timber in the vicinity of streams, or wherever the forest inspectors consider the arable land adjacent requires shelter from the wind. Throughout the whole empire the forests are subjected to the watchful supervision of a specially trained corps of officials, and no efforts are spared to render them as productive as is compatible with their preservation, which latter is the first consideration. In Sweden, the large forests owned by the government (over 5,000,000 acres) are strictly preserved, trees of mature growth being sold at so much per stump, standing, the felling and removal being carried out at the purchaser's expense, but under the supervision of forest officials. Quite recently a law has been passed prohibiting the felling of trees under certain dimensions, but it only applies to the northern portion of the kingdom.

It was proposed to apply it throughout the southern portion as well, but the opposition was so strong that the minister who introduced the measure resigned in consequence of its partial defeat. However, the whole tendency of legislation in the timber-producing countries of Europe is towards imposing restrictions upon forest owners, and investing the government with greater control over their lands, and there is little doubt that any marked decrease in the supply would be the signal for measures of a far more stringent character.

Being asked as to whether the supply in Norway and Sweden was diminishing, notwithstanding the precautions that had been taken, the witness replied, that in the former country the decrease had been very considerable, many of the mill-owners being now compelled to purchase logs of large dimensions from Sweden. In the latter country there are many districts denuded of all the best timber, and it may be said that the annual consumption is, throughout, larger than the annual growth. The falling off in the over-worked districts has hitherto had no perceptible effect upon the export trade, owing to the extension of the railway system, which has opened up many sections of forest land previously untouched. It is alleged by some that the extent of forest that may be made

available by railways is very large, while others assert that in these comparatively unknown districts the quantity of purely merchantable timber is very limited. What may be taken for granted is, that while the area under wood suffers no perceptible decrease, the requirements of the home and foreign markets are augmenting in a ratio far beyond the productive power of the soil.

To the inquiry as to how the government could promote forest culture in the North-west this witness replied:

"In my opinion, their first duty is to ascertain the exact nature and extent of the timber supply in the wooded region, and this can be effected only by an exhaustive survey. It would then be possible to determine the area that should be set apart for the support of a permanent forest growth, due consideration being given to the nature of the climate, the condition of the river and other water sources, and the wants, present and prospective, of the population which the arable soil within access is likely to maintain. It would then be in order to reserve certain tracts for the growth of timber in the most fertile sections of the prairie lands. County or municipal authorities should be directed to establish reserves for the protection of river sources or to act as wind-breaks. Railway companies should be compelled to plant the waste lands bordering their tracts, and road-boards or trustees should be under a similar obligation wherever violent winds or snow-drifts were likely to impede traffic or endanger life. Finally, settlers should be encouraged to plant trees for shade and shelter. It would be erroneous to suppose that this system of forest preservation and extension would entail a burden on the exchequer; the forest lands in the actual possession of the government may, by judicious management, be made to yield a large revenue beyond their expenses, and a portion of this income spent in planting the new reserves would, in course of time, become in such a country the most profitable of investments."

The possibility of raising a second crop of timber in places where it has been consumed by fire being a subject of inquiry, no definite opinion could be expressed. The only experience in Canada was that of nature left to her own resources. What might be done by systematic culture is doubtful, as no experiments had been made; nor, indeed, could it be said that the consequences arising from forest fires had been examined and reported upon by persons of sufficient authority to have any weight attached to their opinions. This much was certain, that wherever a fire ravaged a pine district, the new growth was of a totally different species, and in hard woods the result was similar. When fire runs along the soil it effectually destroys all vegetative power wherever the rock is thinly covered, but when it is confined to the branches and trunks, no reason could be seen why the same species might not be regrown. It was feared that the pine would never pay to cultivate in Canada. At a small outlay the Crown Lands Department might easily ascertain what species of timber could succeed in pine-growing lands, and settle this and many other points of no small moment not only to forest science, but to the whole community.

For the renewal of supplies in Norway and Sweden up to a very recent date, the natural growth has been depended upon to replace the timber felled for commercial purposes and that destroyed by fire. Of late years, however, the growing scarcity of wood has induced many Norwegian mill-owners to purchase cleared or partially-exhausted woodlands, and attempt planting on a large scale, and this movement is extending. Something similar has been undertaken in Sweden by the same class as also by the iron manufacturers, who are at the same time owners of extensive forests. The impression seems to be gaining ground in both countries that the present rate of consumption cannot be maintained, unless steps are taken to assist the efforts of nature. Were the govern-

ments of those countries to introduce measures for the promotion of timber culture, they would not be under the disagreeable necessity of imposing restrictions that operate frequently to the disadvantage of trade. There is no fact better proved than the one that capital invested in the cultivation of timber yields immense returns.

It is claimed that the area under forests in Sweden amounts to 150,000 square miles, and in Norway to 50,000 square miles. Competent judges are of opinion that, in the former country less than one-half, or about 40,000,000 acres, represent the total quantity of land bearing merchantable timber; an area not larger than that which the Province of Quebec might set apart for the production of timber without encroaching on lands adapted to agricultural purposes. In the older Provinces of the Dominion there is an extent of forest territory far greater than there is in the north of Europe, if we except Russia.

Other Statements Concerning the Forest Resources of Canada.

The annual reports of the Montreal Board of Trade and Corn Association, in giving statements of the dealings in forest products from year to year, have repeatedly called attention to the great and needless *waste* that was continually going on, and have suggested the propriety of compulsory regulations to enforce economy in lumbering operations. The custom of levying dues upon logs by number, without reference to quality, naturally leads the lumbermen to select only the best leaving the poorer grades to rot in the woods. But if these dues were imposed on the basis of quality an expensive system of inspection in the woods would be involved, and it has been suggested that the most satisfactory means of collecting the revenue would be by an *ad valorem* rate on the timber sawed and exported, as could be best done by the inland revenue department.

It has been further suggested that rigorous measures should be devised and enforced with the view of preventing the vast damages annually done by forest fires, and that inducement should be offered for information that should lead to the punishment of those originating them, whether wilfully or by accident. "Such a fire may have been set by a stray hunter or fisherman bent on sport, or by the clearing of some pioneer far in advance of the frontier settlement, or, as is often the case, by some of the lumbermen's employees, who, troubled by the flies on the banks of a stream, may have kindled a fire to secure protection from their tormentors which the smoke affords." The remedy against these acts of carelessness or malice must be found in adequate penalties rigidly enforced, and of such degree as to render it certain that due care shall be taken in the handling of fires in the woods.

With respect to the rate of reproduction of woodlands and the measures that deserve attention in securing that end, the reports in former years offer the following statements and opinions:

"To obtain an idea of the regular increase in the value of growing timber it may be supposed that it grows one-quarter of an inch in diameter yearly, which is not over the mark; and as the trees cut will average about twenty inches in diameter, the increase in size will, therefore, be about seven and a-half feet per log, board measure, or over three and a-half per cent. If to this, three and a-half per cent, be added to the sum lost by over-production, an idea of the foolishness of such a policy may be had. It is quite certain that as timber gets cut away and becomes scarce, prices will rise; and that the lumberers of the present generation are actually killing the hen that would, if properly treated, continue to lay golden eggs.

"Government would deserve the praise of the future inhabitants of the country if they would originate a scheme for planting with young timber trees the immense wastes of the Province of Quebec. Such an investment would certainly not pay a dividend to this generation, but it would utilize what will only be a wilderness when the present trees are all cut, and would be a mine of wealth to those who possess it when the timber becomes large enough to be merchantable. By maintaining a judiciously-matured system of planting, the supply might be prolonged indefinitely; as it is, the forests are denuded of all their valuable timber and comparatively nothing grows up to supply its place. A very large proportion of the country north of the Ottawa is not fit for farming, and never can be properly made fit for grain-growing or pasturage, but it is admirably suited for the growth of timber; and even a limited experiment would soon convince all as to the good results likely to accrue. The cost would be small, there being many large tracts so cleared by repeated fires that there is nothing left to burn. The expense would only be the cost of the plants and their planting, and that would not be much; for the seed could be sown in a cleared spot, where the plants would be set out. The whole arrangement would, of course, require to be planned by a practical man and properly carried out; and, such being the case, there need be no fear of the result. What is above suggested can be done, and may yet be accomplished; and he who does it will be a greater benefactor to Canada than any of the statesmen of the present day."

An English traveller, after noticing the apparently abundant supply of woodlands observed in passing through the settled parts of Canada—and the same remark would eqally apply to considerable portions of the once heavily-timbered regions of the United States—thus remarks, concerning the actual resources of these forests in meeting the demands of commerce:—

"It must often happen to the traveller who travels only the more frequented routes, when he sees great rafts made out of huge blocks of timber floating down the Canadian rivers, to wonder what part of the country produces trees so much larger than any to be seen along its way. Near the thoroughfares of Canadian travel hardly any trees of great bulk remain. . . . The fact is that, for the very large timber, the lumbermen have now to go deep into the country, and far out of the common way. Along the travelled routes you see woods out of which all the finest trees have been long ago cut; and even where you do see trees of large girth in Canada, they have seldom had such room to spread and such free air around them as would have enabled them to develop into objects magnificent in themselves. On the Ottawa, for instance, you may often observe how some one tree in the thick forest having somehow been endowed with a little more hardy vitality than its young and half-smothered fellows, has forced its way right through their competing branches, got its head well into the clear, open daylight, and so vigorously prospered as to have grown to immense sturdiness of trunk; but even it is pretty sure to bear marks of the hard struggle undergone, and to have had its branches and off-shoots, on some side or other at least, checked and hindered in their development, if not crushed and blackened into utter deadness. Whatever charm Canadian woods may have, Canada is not the place to see the beauty of fine single trees. To go in amongst Canadian woods are poor in comparison with the new forest; but when the eye ranges over a great tract of them, often they are indeed most beautiful; as, for example, where they rise and fall over hillsides or undulating ground, or are interspersed with gray boulders and sharp points of jutting rock, and are set off by contrast with waters brightly glimmering at their foot. Such are the woods along much of the Ottawa's course, picturesque and lovely at any time, magnificent when kindled with the colouring of an American autumn. Scenery like this will not easily pall upon the eye, but

to travel miles after miles with your view narrowly closed upon either side by flat, unrelieved, unbroken woods, of ungainly and half-developed trees, is a thing far more wearying to the sight than even a journey over the bare wilderness of the prairie. Then, whenever the continuousness of thick woods is broken, it is apt to give place to something not more cheerful. Here you come into the clearing made by some recent fire, where the crowd of living and struggling trees has been burned into a few bare, blackened poles, standing in their gaunt unsightliness, the ghosts of their former selves, with other blackened logs and branches lying strewn over the scorched ground. Again, you plunge into the forest, and see it as it makes itself without the ordering hand of man—now dense, and now thin—trees of different kinds, not generally blended together in intermixture, but standing apart as nature has sorted them; and as, in the great struggle for existence, every kind ousted from elsewhere has been forced into the station best fitted for its support; trees of all ages fighting together for bare life; some vigorous and freshly green, and feathered down to the very ground; some weakly and faded, and only flinging out here and there ragged and ill-balanced branches; some that are mere dead corpses and have fallen aslant out of their places, bruising and breaking the living; some that, with their lower branches all torn and maimed, have yet stretched up out of the throng, and seem as if straining all the life within them to peer over the heads of their fellows, and catch glimpses of how the fire, their deadliest enemy, is spreading havoc nearer and nearer. Again, you are once more in open grounds, lately cleared by some settler, who has ploughed and sown among the tree stumps, those broken columns of the forest ruin; fenced in his clearing with the rude zig-zag wall of logs, the universal snake-fence of the country; built up his log hut in the midst, and set himself to that task which takes half the lifetime of a man to carry out, the turning of forest land into a farm. After many hours of such a journey, and after many days of similar journeyings, the English traveller will not find himself thinking less fondly of the more smiling landscape at home."*

The Waste in Working Square Timber.—Economies in the Timber Trade.

Concerning the great waste from the preparation of hewn timber, as heretofore practiced, the Commissioner of Crown Lands for the Province of Ontario, in his report for the year 1879, says:—

"The great loss sustained yearly by the Province and the revenue from waste of valuable material in the manufacture of square and waney pine, especially in connection with the former, which is hewn to a "proud edge," has for some time occupied my serious attention. It is estimated on good grounds, that one-fourth of every tree cut down to be made into square or waney timber is lost to the wealth of the country, and that the revenue suffers proportionally. When the tree is cut down, it is lined off for squaring, and the "round" outside of the lines is what is called *beaten* off on the four sides; the wood thus beaten or slashed off in preparation for hewing by the broadaxe is the prime part of the tree, from which the best class of clear lumber is obtained when the timber is taken in the round to a saw-mill. Besides the destruction of timber of the finest texture and greatest value, there is the upper portion of the tree, near to and partly into the top, which would yield lumber of an inferior quality, it is true,

* Sketches from America, by John White, Fellow of Queen's College (1870), p: 166.

but suitable either for domestic use or for export to the American market, where, during general business prosperity, large quantities of the lower grades of lumber are required for packing and other purposes connected with trade of all kinds, as much as 100,000,000 feet, it is stated, being sold annually by two or three firms in Brooklyn and New York, to be used as boxes for packages of petroleum alone; but the upper part of the tree is rejected by the square-timber manufacturer and left in the woods, with the fine wood beaten off, to rot and become material for feeding forest fires, by which more timber has been destroyed than has ever been cut down for commercial purposes.

"The following will show the estimated loss to the Province and the revenue from waste in getting out square pine from 1868 to 1877, both inclusive:—Total quantity taken from public and private lands during the ten years, 119,250,420 cubic feet; waste, one-fourth of each tree, equal to one-third of the total mentioned, viz., 39,750,140 cubic feet, or say, in round numbers, 477,000,000 feet, board measure, which may be valued, one-half at $10 per 1,000 feet, and one-half at $5 per 1,000 feet, representing relatively the prime timber beaten off and the inferior timber from the upper part of the tree, average value say $7.50 per 1,000 feet, equal to $3,577,500 loss to the Province for the ten years, or an annual loss in material wealth of $357,750.

"The quantity taken from public lands during the ten years is 87,620,135 cubic feet, the waste on which, on the basis given, being equal to 29,206,711 cubic feet, or 350,000,000 feet, board measure, subject to Crown dues at $750 per 1,000,000 feet, equal to $262,500 lost to the revenue during the ten years, or at the rate of $26,250 per annum.*

"The loss to the country and revenue from timber destroyed by fires, which might have been confined to a limited area, and possibly extinguished, before great damage had been done to the forest, had they not been fed by the *debris* of trees left to rot and dry, is incalculable.

"In 1877, I instructed the officer in charge of the woods and forests branch of the department to prepare a paper on the waste of timber referred to, for the purpose of submitting it to the department of Crown lands of Quebec, with the view of joint action by the two Provinces towards the discouragement of the further continuance of the square timber trade.

"On addressing himself to the task, he found that the lack of knowledge of the mode of dealing with the square timber, after its arrival in the old country in the square "log," was a great drawback to writing intelligently on the subject, as it was essential to know how the timber was disposed of at the great centres of import, such as Liverpool, London, Glasgow, etc.; who the parties were who ultimately acquired the handling of it; where it was cut into specification bills to meet the wants of those who put the product of the "logs," after they had been reduced to the required dimensions, to practical use, etc, so that the department might be in possession of facts, more or less important, when it undertook to show those who are engaged in the trade in Canada, that in abandoning it, and thereby stopping the supply of square timber, they would create a market for their material on the other side of the Atlantic in the shape of sawn lumber.

*If every part of the outside wood wasted in squaring timber could be used, the loss might be estimated at a much higher rate than is above estimated. If the area of a given circle be 1, the area of an enclosed square is 0.636 nearly. The loss is therefore about 0.364 in the outer wood alone, to say nothing of the tops left on the ground. But as there must inevitably be some loss in working, there could scarcely be realized more than 25 per cent. This, in the aggregate of large quantities, is a loss so immense that it should attract the attention of the manufacturers and lead to a thoughtful study into the means for its avoidance. In the careless way that lumber is manufactured, and with the wide-set saws too much in use, it could be easily shown that more than half the material of our forests is wasted, a considerable part of which might, with proper care, be saved.

"I have since procurred some information on the points referred to, from which I learn that the timber is imported directly by wealthy saw-mill proprietors either by the venture of individuals singly, in so many cargoes in each year, or the importation of a number of cargoes annually by several mill-men combined; or it is consigned by Canadian shippers to brokers or agents to be sold on commission; in the latter case, the timber is generally disposed of at auction, at which the saw-mill owners purchase it, and any surplus over what they require for their own establishments they sell in small quantities, sometimes a few pieces at a time, to builders and country dealers of limited means who have it sawn at small mills, and often by hand, at the villages in the interior for local wants. These saw-mill proprietors, having virtually a monopoly of the lumber and bill stuff produced from the timber imported or purchased by them at auction sales, are naturally opposed to the introduction of wood goods into the market they supply in any other shape than in the square log, as at present; but it is time that the Canadian lumberer engaged in the square-pine business should open his eyes to the alarming waste of a material, the value of which is increasing every year; that, in fact, he is stripping his limits and disposing of his timber frequently at a loss, or at best, during several years past, at a rate which seldom pays more than the cost of cutting down, squaring, drawing and taking to market, while at the same time he leaves in the woods as useless one-fourth of each tree he levels to the ground, one-half of the timber so left being the most valuable part of the tree; and see the necessity of his turning his attention to saw-milling operations as a more economical mode of manufacturing his timber, by which he would not only benefit himself by turning to profitable account what is now so wantonly wasted, but the Province generally by increasing the field of labor for its people, while the Provincial treasury would derive additional revenue from the material saved and utilized.

"It may not be out of place to mention here that saw-milling is, to a certain extent, a factor in the settlement of the country, from the fact that many of the employees, from their steady habits and value as workmen, are kept in permanent employment summer and winter in connection with the establishments, and are induced in consequence to take up lands in the vicinity, which are improved by the families of those having grown-up children, and by hired help in the case of unmarried men, till ultimately considerable sections in the neighborhood of the mills would become settled and cleared, with comfortable homes on the locations; while, on the contrary, the men employed in getting out square timber are generally without fixed homes or continuous employment. Their engagements terminate in the spring; in the interim, until they re-engage for the following winter, they too frequently remain idle, and spend their earnings in a reckless manner, and are penniless and often in debt when they return to the woods."

After noticing various available forest commodities for exportation from Canada, such as pit-props, mining timbers, telegraph poles, railway ties, etc., the forms and dimensions best suited to the English market, and suggestions as to their preparation, the commissioner refers to the topic he had previously been discussing with reference to the encouragement of sawn goods for exportation instead of the wasteful practise of getting out hewn timber. His suggestions have no local application, and are well suited to any region or country that has commodities to export.

"The characteristic of modern commerce is to seek out markets wherever they can be found, in which commodities to be disposed of can be sold to the best advantage whether natural products in a raw state where the means of profitable manufacture do not exist where they are produced, or in a manufactured state when such means are available, and in proportion to the energy and enterprise

used in pressing forward and occupying every vantage ground in trade, is the measure of success which attends individuals and communities. It is not usual in these days to wait until a customer comes knocking at your door to find out what you have for sale; to succeed, it is necessary that such should be made known far and wide; and to create a business of any magnitude the first object is to find out what is required not only at home but abroad, *and having the article*, to calculate whether or not the field can can be entered at a fair profit in furnishing what is wanted.

"In the Canadian timber trade there seems to have been no lack of energy; but in my humble opinion it does not appear to have been accompanied by that kind of prudent enterprise which might be expected from the intelligent men who are engaged in it. The square-pine manufacturers have been contented from year to year to go on bargaining with a Quebec merchant to get out so many cubic feet of a certain average for a price agreed upon; the merchant writes home to his agent or partner to effect sales, or goes himself or some one for him for that purpose, or frequently ships on his own account the timber which the lumberer has contracted for and delivered to him. Not unfrequently the lumberer possessed of means gets out his timber without advances in money or supplies having been made to him and takes it to Quebec to sell it at the best price he can obtain from the dealers there. Sometimes this has succeeded better than contracting; but where the venture fails through a downward tendency in the market or a rise in freights, it becomes a serious matter to hold it over, as cove charges and other incidentals rapidly effect a shrinkage in the value of the article.

"But so it has gone on since the early days of getting out square pine; the same well-trodden rut has been travelled; the same traffic in the timber in the crude shape of the square "log" has been continued, the actual producer and *quasi* proprietor of the pine upon the timber limits reflecting on the waste of material, or the propriety and prudence of economizing it and turning it to more profitable account.

"Saw-mill owners, although they have had trying times during the past few years, are not generally so unfortunate as the operators in square pine, the trade in which is peculiarly fluctuating and uncertain. The former have always had more or less of the domestic trade: and, unless under extraordinary circumstances, such as the late prolonged depression, can depend on the United States for a market, with prices generally affording a reasonable profit, notwithstanding the American duty of two dollars per one thousand feet; and with these markets, domestic and across the line, they have seemed to be satisfied without seeking a European opening for their lumber.

"I feel a delicacy in giving advice in this matter to parties who may very naturally say that they know their own business best; but, nevertheless, I will venture to observe that those in Canada engaged or interested in the trade in timber which is next in value to agricultural products in the exports of the Dominion, viz., in 1878, $20,054,829, and $27,281,089, respectively, should acquire a knowledge of and endeavor to cultivate a transatlantic trade, and would suggest that a spirited effort should be made to extend the sawn-lumber business to countries which have hitherto imported the timber in a crude state and manufactured it to suit their purposes. Already have the European and other markets been successfully invaded by the produce of industries of various kinds, from the American continent, and there seems to be no reason why our great staple export should not meet with equal success.

"It may seem out of place in this report to indicate in anything like detail the steps which might be adopted to carry out what has been hinted at, but a

preliminary step would seem to be for a few saw-mill proprietors to join together and send to the old country two or three practical men, having a thorough knowledge of lumbering, the different qualities of lumber produced in Canada, and the minutiæ of the working of saw-mills, who might be accompanied by one or two joiners or house carpenters to make technical observations as to the various uses and forms in which the lumber is applied. Let these parties visit the larger saw-mills in England, Ireland, and Scotland, and on the continent, if deemed expedient, with sufficient time allowed to inspect and report on the whole subject to their employers, having specially in view the required dimensions of boards and bill stuff in all forms, which would suit the several markets; and also make inquiry as to freights, insurance, port charges, etc., and upon such report, and after due consideration, the parties interested would be in a position to come to a conclusion whether or not a fair paying business could be pushed in the direction indicated. The attempt seems to be worth making; and if prepared assortments of Canadian lumber were exhibited in the principal markets of the old country, even although they may not take at first, which perhaps would be too much to expect, there is at least a prospect of success through the exercise of sound judgment, patience, and perseverance."

Exportation of Forest Production of Canada.

From the earliest period of colonial trade the export of timber has been an important item of production for the British market, and much of the timber exported from the northern frontier of the United States has been shipped from Quebec, being generally rafted down the rapids of the St. Lawrence and placed upon vessels at Quebec. In later years the timber of the country bordering upon the upper lakes was brought in vessels to Clayton, N.Y. or to the foot of Wolfe Island, or to Garden Island, near Kingston, at which places for a long period, the principal business of making up rafts for the navigation of the rapids has been done. More recently the business of Clayton has much declined, while that of Wolfe Island and of Garden Island has increased.

This exportation of timber has been largely affected by the tariffs, which from political and financial reasons, the British Government thought it proper to impose.

From the report of a select committee of the House of Lords, appointed in, 1820 to inquire into the means of extending and securing the foreign trade of the country we learn that the encouragement afforded to the importation of wood from the British Colonies in North America by the imposition of heavy duties on wood from foreign States was of comparatively recent date, and that it had not formed a part of the commercial or colonial policy of the country before the then recent European wars. Till 1809 little or no duty had been imposed upon the various species of timber, but in that and the succeeding year, however, the nature of the political relations with the Baltic powers led to an apprehension that great difficulty might be found in deriving the usual supplies of timber from that quarter, not only for domestic use, but more particularly for the purposes of ship-building. The Canadian timber trade had not then been large in the aggregate, although relatively important to the country. There being some risk and uncertainty in a further expansion of the business, it was deemed expedient to give Canadian timber the benefit of an exemption from all duties

on such as was fit for naval use, and a duty little more than nominal on other descriptions, while, at the same time, a considerable increase was made in the duty on wood from the north of Europe.

High permanent duties and a temporary war-duty were accordingly imposed upon all descriptions of wood imported from foreign countries.*

The Canadian merchants were never led to believe by the Government that these duties were to be permanent, but an expectation was held out that the duty of £2 1s. first imposed would be continued for some considerable time. No such expectation was fairly raised with respect to the war duty and the duty imposed in 1813, and the exemptions from duty on Canadian timber had always been temporary, and were limited to July 1820†

The protection thus begun was continued many years, and the two great monopolies of corn and timber—the first maintained for the assumed benefit of the possessors of land; the second conceded to the clamour of a certain class of ship-owners—became through after years the object of attack by an energetic class of reformers, representing the more numerous but less organized class of consumers, until their efforts were finally crowned with success. After successive reductions from time to time the rates on timber from every country were reduced about 1859, to the uniform rate of 2s. per ton, and not long afterwards they were taken off altogether.

The following tables are derived from the reports upon Trade and Navigation reported annually by the Minister of Customs since the beginning of the Dominion Government, July 1, 1867, and previously by the Receiver-General of Cana la. The column of years will be understood to be calendar years until the change made in 1864, when the fiscal year, beginning July 1, was subscituted.

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*49 Geo. III, c. 98. These were doubled by the 50 Geo. III. c. 77, and afterwards partially increased by the 51 Geo. III. c. 93 and by the 52 Geo. III. c. 117 and a duty 25 per cent. upon the whole of the permanent duties were added by the 53 Geo. c. 33. The several duties above referred to were afterwards arranged and consolidated by the 59 Geo. III. c. 52.

The duty upon a load (50 cubic feet) of Baltic timber, which at the beginning of the wars in the early part of this century had been 6s. 8d. was raised by inconsiderable steps to 26s. 2d. in 1806, doubled in 1811, and in 1813 further advanced to 65s. Colonial timber, which had been admittep free of duty up to 1798, was then subjected to a duty of 3 per cent. *ad valorem*. From 1803 to 1805 the *ad valorem* rate was changed to a specific duty of about 2s. a load, and in the latter year this was removed. In 1821, in consequence of the report of the committee of the House of Lords, above cited, the system was changed by reducing the rate on European timber, while that from the colonies was made 10s. In 1840, 1s. 6d. per load was added to them respectively. In October, 1843, the duties were reduced to 25s. per load on foreign timber, and 2s. per load on that from British colonies.—G. R. Porter's *Progress of the Nation*, 1847, p. 380.

† *Parliamentary Papers*, 1820, vol. 3. (269), p. 4.

COMPARISON OF THE SEVERAL CLASSES OF FOREST PRODUCTS EXPORTED FROM THE PROVINCE OF CANADA DURING THE TWELVE YEARS PRECEDING THE FORMATION OF THE DOMINION GOVERNMENT.

(Quantities and Values.)

Years.	Ash.		Birch.		Elm.		Maple.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1856	2,589	$14,403	4,556	$40,200	36,453	$508,433	18	$169
1857	3,485	25,360	5,026	46,985	37,984	432,822	169	1,593
1858	2,378	16,999	4,005	30,339	19,451	163,389	37	285
1859	4,313	24,067	7,937	56,294	26,278	200,840	84	728
1860	2,478	14,976	12,508	100,759	25,629	207,297	249	1,996
1861	2,422	12,708	8,397	60,585	32,610	265,562	127	1,014
1862	2,496	12,770	4,159	32,424	27,689	202,573	139	882
1863	8,341	42,255	11,256	89,111	53,392	421,180	440	2,620
1864*	1,319	6,667	3,315	26,413	14,331	114,414	53	366
1865†	3,670	22,689	10,488	82,638	49,048	387,655	110	1,350
1866†	2,860	20,986	8,793	72,505	29,483	255,670	152	1,268
1867†	3,631	26,074	9,394	81,355	28,476	252,647	76	643

* Half year ending June 30. † Year ending June 30. Since 1864.

Years.	Oak.		White pine.		Red pine.		Tamarack.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1856	33,814	$377,190	361,046	$2,062,003	61,943	$471,691	2,117	$13,381
1857	48,539	576,630	500,781	2,821,320	61,323	526,458	4,571	28,471
1858	26,904	377,561	344,981	1,811,340	53,143	374,079	995	5,411
1859	34,300	359,731	395,694	2,249,006	43,643	363,567	2,185	11,382
1860	41,553	404,861	490,233	2,582,605	62,573	507,610	2,589	17,623
1861	55,979	526,997	523,112	2,594,388	71,381	508,609	1,802	11,116
1862	47,436	527,317	430,257	2,110,046	66,563	452,113	14,861	33,301
1863	73,327	754,328	650,483	3,304,903	103,329	745,642	19,591	124,955
1864*	28,387	205,546	194,822	918,323	32,653	230,831	5,326	34,994
1865†	118,313	1,089,417	606,300	2,963,534	108,877	761,037	10,681	65,332
1866†	64,026	710,861	450,950	2,324,063	85,638	593,134	11,266	71,938
1867†	62,895	696,461	413,036	2,118,754	78,792	499,858	5,411	36,015

* Half-year ending June 30. † Year ending June 30. Since 1864.

Exports to Great Britain.*

The timber trade of British North America is principally concentrated within the Provinces of Nova Scotia and New Brunswick, and throughout the St. Lawrence and Ottawa River basins, and north-western Ontario.

Up to about the year 1842—and partially afterwards—a very much lower duty was levied in Great Britain on wood which was the produce of Canada than on similar imports from European nations. This led to the fostering of a very large trade, especially in hewn timber, from Quebec and the lower ports on the St. Lawrence—a region which forty or fifty years ago was looked upon as Great Britain's principal source of supply. Large quantities of white pine and spruce as well as a small supply of red pine are still exported; the first being partly hewn and partly sawn, while the second is mostly in a sawn condition. A considerable quantity of oak, elm, ash and birch is likewise exported.

The following return of shipments will best show the movements of the Quebec export trade for the nine years ending with 1882.

In 1874,	854	timber	carrying vessels of	636,672	tons cleared out.
" 1875,	642	"	"	478,441	" "
" 1876,	786	"	"	624,110	" "
" 1877,	796	"	"	670,620	" "
" 1878,	476	"	"	399,833	" "
" 1879,	433	"	"	364,628	" "
" 1880,	634	"	"	555,451	" "
" 1881,	459	"	"	380,186	" "
" 1882,	426	"	"	359,925	" "

Small parcels of sawn wood are shipped by steamer from Quebec, and these are not included in the above table; but such supplies although considerably larger than they were some years ago, are not sufficient to alter the fact that this export trade of Quebec is declining.

The following is a detailed statement in loads of the principal items of which that export was composed for the five years mentioned, namely:—

	1879	1880	1881	1882	1883
Hewn wood:					
Square and waney pine	106,009	231,051	182,038	158,243	208,540
Red pine	16,276	28,664	18,440	20,494	20,979
Oak	33,620	46,337	37,667	39,147	42,658
Elm	10,880	20,836	15,943	15,567	14,798
Birch	3,929	11,177	5,878	42,274	4,661
Sawn wood:					
Pine deals	122,602	266,900	177,659	144,315	183,016
Spruce deals	130,740	147,673	141,962	127,752	125,108

There are no means of ascertaining the exact amount of the Quebec shipments to the United Kingdom, but it is probably about five-sixths of the whole quantity despatched over sea. The total export of Quebec wood to Europe

*Robert Carrick, *Gefle, Sweden*, in Forestry and Forest Products (Edinburgh), 1884.

in 1883 had an approximate value of $7,802,550. A small but increasing business is likewise now being done with South America.

The city of Ottawa is the headquarters of the timber-manufacturing interest of Canada. The wood goods sawn here are principally pine boards for the United States market, and it is no exaggeration to say that the Ottawa valley production of sawn timber is at present the largest in the world. This reached a total of about 1,320,000 loads in 1882. Such a production far exceeds that of any district in Europe.

New Brunswick and Nova Scotia, however, must for the present be regarded as the seats *par excellence* of Great Britain's supply of American spruce. The chief ports that are engaged in shipping this class of goods, are St. John, Miramichi, Dalhousie, Richibucto and Bathurst, the bulk being despatched from the two first named.

In connection with this question, it is necessary to consider whether the Dominion of Canada can keep up or increase her present output, without endangering the future of her forests, and what proportion of that output will be required at home and in the United States.

In seeking an answer to these queries, only white pine, red pine and spruce need be considered, seeing that the quantities of oak, elm, birch and ash now being exported, are comparatively small.

So far as red pine timber is concerned, the supply has gradually diminished to a quarter of what it was in 1863. A substitute for it has been found in pitch pine, so that it is not much missed.

Hewn and sawn white pine is a most valuable description of timber, and when of the finest grades, is unrivalled for many purposes, such as house building, and other wood-work. It has been largely and continuously imported into the United Kingdom for more than fifty years, and a fully equivalent substitute will be difficult to find. The White Sea redwood approaches nearest to it in point of quality, but the latter in addition to its smaller dimensions and greater knottiness has other defects that diminish its value in comparison with the former.

The quantity of hewn white pine received at Quebec in 1876, was about 19,243,733 cubic feet, whereas in 1883, it was but 11,198,557 cubic feet, or taking the average for the years 1871 to 1875 inclusive, it exceeded 14,000,000 cubic feet per annum; while for the five seasons, 1879 to 1883 inclusive, it was but 8,412,654 cubic feet. On the other hand the supply of white pine deals to Quebec has not decreased in so pronounced a manner, for although in 1876 it reached 278,363 loads, and only 147,979 loads in 1883, the average of the five years ending 1885, was 187,187 loads, against 238,731 loads on an average for the five years ending with 1880. Such figures in conjunction with the history of the quantity exported of late years, bear abundant evidence to the fact that a diminished quantity is available for export to Europe.

Reference may be made to the attempt which was made in connection with the tenth census of the United States to ascertain the quantity of mature white pine then existent in that country and ready for the axe. Professor Sargent, who had charge of this part of the census, reported in 1882 in these words:—"The entire supply (of white pine) growing in the United States and ready for the axe does not to-day greatly, if at all, exceed 80,000,000,000 feet; and this estimate includes the small and inferior trees which, a few years ago, would not have been considered worth counting. The annual production of this timber is not far from 10,000,000,000 feet, and the demand is constantly and rapidly increasing."

According to this semi-official statement, there was, some years ago, only about eight years' supply, and now there is supposed to be only six or seven

years' consumption ; there is, fortunately, reason to believe that the statement is inaccurate, and proof of the assertion that the United States consumes 5,050,000 of St. Petersburg standard hundreds, or 16,665,000 loads of white pine wood annually, will be awaited with interest. It must be taken into consideration that Canada supplies a good percentage of the present United States consumption, and that the precise minimum dimension has not been defined which the census assessors have put down as ready for the axe. The large number of trees, too, which, in the course of eight or ten years will reach the cutting size, although now a trifle under it, must also be considered. Taking credit for all these items, however, and assuming the available quantity to be as much underrated as the consumption is evidently over-estimated, the outlook is sufficiently alarming, and amply justifies compulsory replanting and reforesting enactments wherever the ground is best adapted for the production of forest.*

As regards American spruce, which competes in the British market with Swedish and Russian white wood, the question of its future supply becomes one of paramount weight. One of the most important facts to be borne in mind, is

* At a meeting of the Genessee Valley Forestry Association, held in the Chamber of Commerce Rooms at Rochester, on the 10th May, 1892, Mr. B. E. Fernow, Chief of the Division of Forestry, Department of Agriculture, is reported to have said : " Although there is still plenty of virgin timber in the country, the time when it will be comparatively exhausted is drawing near. We have in the United States about 500,000,000 acres in woodland. If all this were in good condition, with full grown timber on it—which is far from being true—there could not be found on it more than 1,500,000,000,000 cubic feet of wood, which is at the rate of 10,000 feet b.m. of saw-timber per acre in the average. Since we use annually from 20,000,000,000 to 25,000,000,000 cubic feet of wood, of which 30,000,000,000 to 40,000,000,000 feet b.m. is saw-timber, it appears that even with these extravagant assumptions regarding supplies, we would exhaust them in sixty or seventy years, assuming that new growth is consumed by increased requirements. That this increase takes place may be learned from my computation, according to which the values of forest products and wood manufactures during the census years 1860, 1870, 1880 and 1890 amount to $300,000,000, $600,000,000, $900,000,000 and $1,200,000,000, respectively, or an increase of thirty per cent. for every decade ; and since it takes at least sixty to seventy years to grow saw-timber—what we now cut is usually twice as old, or more—it would appear that whoever invests his money in forest culture to-day must be amply repaid by the crop, albeit his children will reap the profits really. Certain it is that it always requires time, and quite a long time, before the results of such management become visible, and that is largely why people are afraid to stake their money in the business.

" For profitable forest management, good, permanent roads are indispensable. Their money value may be judged from the experience of the little Dukedom of Brunswick, where, without any other changes, the building of a rational system of roads through its forest domain increased the income from the forest management by twenty per cent.

" In the government forests the annual net profits range from $4.11 per acre of forest in the highly cultivated and densely populated Kingdom of Saxony, to $1.19 in mountainous Bavaria, where the government forests comprise 2,300,000 acres on which the government spends $3,130,000 and gets in return $5,880,000, netting $2,730,000 every year, and giving besides employment to a large force of men. In Prussia the net annual profit for every acre of woodland was at the rate of $1.31 on $6,000,000 acres woodland, the expenditure last year being nearly $8,800,000 for the administration, and with prices in the woods of three dollars per cord of fire-wood in the average, and ten dollars and thirty-two cents per thousand feet b.m. of saw-timber, the returns were over $17,600,000, netting $8,835,119, and this is continuous, ever increasing revenue.

" Why should not the State of New York, now owning as State property twice the area which little Saxony owns in woodlands, and proposing to acquire additional lands so as to make the area between that of Bavaria and Prussia's government forests, why should not New York make its Adirondack forests, if not as profitable, yet fairly so, as those States have made their woodlands pay !

" To bring this about, it is necessary to secure as soon as possible the acerage before it becomes more expensive, to place it under competent administration, to open up and make accessible the wilderness by a rational system of well-built roads, and inviting, not keeping out the railroads, under such restrictions to be sure as will properly guard the forest against danger from fires, for accessibility is the key-note of practical and profitable forest management."

the ease, rapidity and spontaneous manner in which this tree reproduces itself. Unlike white pine, which requires a century to grow a standard log, spruce is almost irrepressible, and a spruce forest from which all the trees measuring twelve inches and upwards in diameter have been taken, will, after a rest of two decades, be ready for work again.

It does not appear that any systematic attempt has been made by the authorities to reduce to figures the available quantity of mature spruce now growing in New Brunswick, Nova Scotia, and the immense forest belt which lies between the Ottawa river basin in the west and Mingan in the east. All these districts, however, according to Mr. Joly, late Premier of the Province of Quebec, contain immense quantities of spruce.*

The following tables exhibit the total number of pieces of squared white and red pine and other woods, and of pine saw logs cut in the upper Ottawa territories of Quebec and Ontario, on Crown lands, and also on private lands from 1826 to 1881 (30th June) inclusive, that is before and since Confederation as closely as can be learned from the records of the Crown Timber Office, Ottawa.†

FROM 1826 TO 1866 INCLUSIVE.

	Square timber.		Pine saw-logs (only).	
	Ontario.	Quebec.	Ontario.	Quebec.
White pine	3,048,382	1,739,094	4,084,258	2,230,056
Red pine	1,714,412	978,064	....	.....
Other wood	255,950	146,019	.....	.....
Totals	5,018,744	2,863,177	4,084,258	2,230,056
Deduct from private lands	1,074,418	612,931	874,349	498,804
Cut on Crown lands	3,944,326	1,751,246	3,209,909	1,731,252

*The pitch-pine referred to in this chapter is the *Pinus Australis* of Michaux, otherwise the Southern Pine, the trade in which has been entirely developed during the last twenty years. Its importation to Great Britain is extending rapidly. It is shipped from the so-called Pitch Pine States, situated to the east of the Mississippi River, namely, the Carolinas, Georgia, Florida, Alabama, and Mississippi.

The wood of the pitch-pine tree is the heaviest of the pine family, and, like all high resinous woods, is supposed to possess great durability in climates of moderate severity. A very large industry has been developed in the Southern States in connection with the gathering of its resinous products, such as tar, turpentine, pitch, and the like. Turpentine is the raw sap of the tree, and the "boxing" or tapping necessary to collect this is supposed by some to be injurious to the "alburnum" or sapwood, although it has probably little effect on the heartwood, or "duramen."

†A. J. Russell, Crown Timber Agent, Ottawa, in Reports on the Forests of Canada, London, (England) 1885.

From 1867 to 1881 Inclusive.

	Square timber.		Pine saw-logs (only).	
	Ontario.	Quebec.	Ontario.	Quebec.
White pine	1,925,247	1,119,382	17,920,850	17,277,103
Red pine	485,141	118,626	.....	.....
Other wood	238,874	63,319	.....	.....
Totals	2,649,262	1,301,327	17,920,850	17,277,103
Deduct from private lands	615,879	244,895	3,380,275	2,679,412
Crown timber	2,033,383	1,056,432	14,540,575	14,597,691

Total Recorded Product, Upper Ottawa Agency, 1826 to 1881, 30th June

Ontario,	7,173,182 pieces pine;	494,824 other woods;	22,005,108 saw logs.
Quebec	3,955,166 " " ;	209,338 " ;	19,507,159 "
Total,	11,128,348 " "	704,162 "	41,512,267 "

In the foregoing table it is to be observed that square timber and saw-logs only are included, and all other wood goods are omitted, as unimportant for the object of the table. The dues accrued from them are, however included in the following equally brief exhibit of the revenue accrued from Crown timber dues in the upper Ottawa territories of Quebec and Ontario respectively from 1826 to 1881 inclusive, being from the remotest period of which there are any records in the Crown Timber Office, Ottawa.

Period.	Ontario.	Quebec.	Totals.	Years.
1826 to 1834	$ 169,078	$ 46,023	$ 215,101	9
1835 to 1851	934,735 $\frac{56}{100}$	460,643 $\frac{79}{100}$	1,395,379 $\frac{35}{100}$	17
1852 to 1857	453,058 $\frac{42}{100}$	282,879 $\frac{21}{100}$	735,937 $\frac{63}{100}$	6
1858 to 1866	896,096 $\frac{27}{100}$	609,861 $\frac{15}{100}$	1,505,957 $\frac{42}{100}$	9
1867 to 1881	3,279,538 $\frac{32}{100}$	3,439,832 $\frac{83}{100}$	6,719,371 $\frac{10}{100}$	15
1826 to 1881	$5,732,506 $\frac{47}{100}$	$4,839,240 $\frac{3}{100}$	$10,571,746 $\frac{50}{100}$	56

The collection of timber and slide dues being combined, greatly facilitates and tends to secure the accurate collection of both. The same timber and the same men are dealt with at the same time. The returns of the timber rangers of their inspections supported by sworn statements of cullers, afford the means of effectively checking the accuracy of the certificates the lumberers give the deputy slide masters, which through careless error or fraud might be quite erroneous, as to the numbers of saw-logs especially, and as to where they came

from. On the other hand, the assistance the Dominion Officers of Inland Revenue and Customs, and their collectors of canal dues, are authorized to render at the request of the Crown timber agent, in preventing the departure of vessels, or the passage of barges loaded with lumber through canals is often of the greatest importance in securing the payment of timber dues. On the River Ottawa no boats or barges loaded with lumber are allowed to pass through the canals without permits from the Crown timber agent. Such permits are occasionally withheld for the enforcement of the payment of timber dues, and the detention of the boats (till released by direction of the Crown timber agent) is always promptly effected by the officers of the Dominion.

The Public Timber Lands of Canada.—Crown Lands.*

These lands belong to the Provincial governments within which they lie with the exception of those in the North-West Territories and the Province of Manitoba, which belong to the Dominion government. In Quebec and Ontario these lands are in charge of a Commissioner of Crown Lands ; in New Brunswick, of the Surveyor-General; in Nova Scotia, of the Attorney-General ; and in British Colunbia, of the Chief Commissioner of Lands and Works.

It will be seen that hitherto almost no attention has been given in Canada to the reproduction of timber upon lands from which it has once been cut off ; but all the laws and regulations that have been established have reference only to the native forests of the country and to the securing of a revenue from the existing supply. The reservation of young timber, too small for profitable use, by the limitation of a size below which it should not be cut, has received attention only in the Province of Quebec, and only in respect to pine timber. Questions of conservation and restoration are, however, beginning to attract notice, as will be seen in the following pages, and it is earnestly to be hoped that a knowledge of the true interests of the country will lead to effectual measures for this end, before vested rights have been established to embarrass, and before the need of these measures has become urgent.

Former Timber Regulations in Canada.

The system of granting licenses to cut timber on the public lands in Canada was introduced in 1825, and since that time the right of renewal, upon compliance with regulations has been practically acknowledged. In 1845 an Order-in-Council was passed, making the licenses annual, but with the above understanding, and in the order of 1849 the lessee was permitted to transfer his limit by simple assignment. In 1851 a ground-rent system was introduced.

The branch of woods and forests in the department of Crown lands was organized under the former government of Canada in 1852. A system of local agencies was established, and reforms much needed had begun to be introduced at the time when the Dominion government was inaugurated. Among the abuses of earlier times was the monopolizing of immense tracts without using the privileges or paying an equivalent for them. A ground-rent system was at last adopted, which made reserved but unoccupied privileges unprofitable to hold, more especially as the rate increased in geometrical proportion as the penalty for not using.

As lessons of experience in questions of timber management always have value, it may be interesting to learn how this expedient, apparently so easy to enforce, and so effectual to control the mischief, was found to operate when put to the test of trial.

*Hough ; Report upon Forestry, (U.S.) 1878-79.

The Commissioner of Crown Lands of Canada, in his report for the year 1856, in describing the workings of this rule, says:—"It will be readily seen, however, that the operation of such a system would reach a climax within a limited period; that, although it could scarcely be said to be even a check in any degree upon monopoly, in the first instance, the increase in the annual rents on unoccupied tracts after the first few years, became so sudden and great that a crisis became inevitable.

"This crisis arrived in the year before last (1855), the rents of unoccupied berths having in many cases, reached a figure the preceeding year which, if again doubled, with a certainty of being quadrupled in 1856, would have rendered the ground untenable.

"A general effort was therefore made by those interested to have the system suspended or rescinded. A new feature in the controversy arose on this occasion from the interference of a great body of the shipping merchants of Quebec, who submitted a counter-petition opposed to the views of those of the producing merchants who desired to be relieved from the accumulating ground-rents.

"The lumber trade being one of the principal resources of the country, the regulations by which it is governed must always be of great moment and worthy of the greatest consideration, and therefore I trust that the importance of the subject to the country at large may be deemed sufficient to warrant a pretty extended reference to the consideration bestowed upon it at the period of the crisis referred to, and which has resulted in establishing a degree of permanency in the institutions connected with it which was previously unknown.

"As the lumber trade is ordinarily conducted in this country, there are two distinct branches of it, viz., that in which the producer is engaged, and that which is carried on by the shipper. There are some firms who are engaged in both branches of the trade, but, although mutually dependent, they are always distinct from and sometimes antagonistic to each other. The principal feature in which they conflict is that it is the interest of the producer that the prices should rule high, as compared with the cost of production, while it is the interest of the shipper that they should rule low in the lumber markets of the country, as compared with the prices in England.

"This subject was very fully treated of in the evidence taken before the parliamentary committee in 1849, appointed to inquire into the causes of the ruinous state of the trade which had existed for some years previous to that date (see appendix P.P.P.P. of that year), which it may not be considered inopportune to refer to, as perhaps the greatest crisis the trade has ever had to contend with since it grew to anything like its present importance.

"By the evidence obtained by the committee on that occasion, it will be seen that, commencing with the year 1846, there was a supply in the Quebec market wholly disproportionate to the demand, originally caused by an unwisely forced production, and aggravated in the succeeding years by a diminished consumption arising from the general depression in commercial affairs which occurred in 1847. The important fact to be observed here, is, that in 1846, a year in which the statistics of the trade proved that all the elements of prosperity existed in the highest degree, the most wide-spread ruin occurred among the producers. The business of 1845 was most profitable to the country and to individuals engaged in the trade, while the business of 1846 was ruinous to individuals and a loss to the country. The demand and the shipments in 1845 exceeded those of previous years; the demand and the shipments in 1846 were equally great, or even slightly in excess of those of the previous year. The reason of the prosperous state of the trade in the one year and its ruinous state in the other, is, therefore, to be found in the fact that in 1845 the supply was in just proportion to the demand,

while in 1846 a supply was forced upon the market out of all proportion even to the great demand and shipments of that year; the result was that, in the one year, individuals realized a profit on their business and the country at large reaped a profit on the total export, while in the other year individuals had, from over-supply, to sell for much less, timber which (from over-stimulated production, enhanced price of labor, etc.) had cost more, and were, therefore, in many instances, ruined, a loss being at the same time sustained by the country at large, which, in the total export of the season, parted with so much capital at something like half its value.

"The over-production of 1846 (which did not all reach market that year) continued to depress the trade for several years, the supply of square timber resulting from it in Quebec market having been as follows, viz.:—In 1845 there was a supply of 27,702,344 feet, to meet an export of 24,223,000 feet; but in 1846 a supply of 37,000,643, to meet an export of 24,242,689 feet; and in 1847 a supply (including the overstock of previous years) of 44,027,253 feet, to meet an export of 19,060,880 feet. Here then the distinctive interests of the different branches of the trade may be seen. The business of 1845, which was so profitable to the producers and the country, having been of but doubtful benefit to the shippers, who had to pay quite as high a price here as the prices in England would justify; while the business of 1846, which was so ruinous to the producers, who had to sell at less than the cost of production, was profitable to the shippers, who obtained the timber in Quebec at about half the price it had cost them the previous year, while there was not a corresponding diminution of price in the English markets, at least during that season, and those of them who had contracted realized the full benefit of their contract prices on the diminished rates they had to pay in Canada.

"It is needless to discuss the continued depression of the succeeding years, in which the general derangement of commercial affairs, which began in 1847, was the principal cause; but there can be no doubt that, so far as the lumber trade was concerned, the depression was aggravated by the enormous production of 1846, which continued to hang upon the market for years after. But it is important to observe that the cause of the over-production itself was shown by the parliamentary inquiry referred to, to have been in part indeed the natural stimulus arising from the successful operations of the previous years, but, in part also, the unwise course, at that time pursued by the government, of forcing production, as will hereafter appear upon explanation of the regulations.

"It is to the advantage of the shipping interest that production should again be forced; it is to the advantage of the producing interest that it should be limited. Shippers and producers are alike essential to the trade, and while it would be a mere waste of the labor and capital of the Province for the Government to *force* production, it may be safely assumed that the true course is to let the trade, as far as practicable, regulate itself, without interfering on the one side or the other.

"But it so happens that there must be some regulation to govern the cutting of timber on Crown lands, and it is an unavoidable incident of such regulations that they must exercise some influence upon the trade. The object the regulations should have in view, therefore, in this particular, is to exercise that influence to the least extent possible at the same time that they hold out equal facilities to all desirous of embarking in the trade, due protection to all in the rights acquired and full security for investments of capital necessary to be made, to render the resources of the timber territories available, but not to lock them up in unproductiveness.

"Such being the principles at stake and such the adverse interests involved, both parties memorialized the government, each endeavoring to secure the preponderance of their particular views.

"The memorial in the shipping interest did not, however, correctly represent the grounds upon which those who signed it really opposed the object sought for by the producing interest. I would indeed be sorry to accuse gentlemen of their standing and respectability of any intentional mis-statements, but yet, from being ignorant of that branch of the trade with which they were not connected and of the regulations by which it was governed they allowed themselves to be led into a train of argument which raised entirely false issues, some erroneous information or misconception having led to the result that every paragraph in their memorial conveyed either inferentially or directly some statement that could not be sustained by facts.

"They assumed in the first place that the ground rent was "a condition agreed to by the license holders when they obtained the privilege of cutting, etc.," which was not the fact as regards the great bulk of the trade, the timber berths having been obtained without any such condition, and the ground rents being an additional impost to which they have since been subjected. They next stated that "of late years the bulk of the timber limits of the Crown have been monopolized by a few houses," whereas, there had been no change by which this could have been effected, the only change introduced for several years, having been the very one they were seeking to maintain, establishing ground rents etc. as the most efficient check upon monopoly which had yet been found.

"I may here remark that the assumption that a great monopoly of the timber territory existed was at best a chimera, as proved by the fact that there are upon an average about nine hundred timber births under license in the hands of about five hundred persons. The assertion, therefore, that there is monopoly where there are five hundred competitors, each equally free to deal to a large or a small extent as he sees fit, or his means will allow, needs no further contradiction.

"There may indeed be some local monopolies, where persons of large means buy up the lesser establishments in their vicinity; but anything approaching a general monopoly in this trade, under existing regulations, is impossible; and, so far as any local monopoly exists, it is not by the government that it has been created or is sustained, but by the influence of capital, the application of which for the purposes of trade the government cannot control.

"The greatest local monopoly that has yet arisen in the trade was that which existed a few years on the Saint Maurice, and there it arose from the influence of capital at public competition, although the regulations on that occasion were specially calculated to throw the trade of the territory into the greatest number of hands possible. Capital, however, bore down all opposition for the moment, and it is due to the firmness with which the government resisted repeated, most urgent, and most influential appeals to relax the regulations that that monopoly was ultimately broken up.

"Indeed it may be truly said that the shipping branch of the trade, as carried on at Quebec, bears much more the character of a monopoly than the producing branch, the whole of the business arising from about five hundred competitors on public lands, and perhaps an equally great number of producers on private lands, being, so far as the business centres in Quebec, in the hands of about forty shippers, nine or ten of whom do more than three-fourths of the whole business. But this, in like manner, so far as it can be called a monopoly, is the result of capital, and is not influenced by government, which can as little interfere to limit the operations of the producer to one timber berth or a hundred timber berths as to limit the business of the shipper to one ship or a hundred ships.

"The memorialists also stated that the monopoly of which they complained was 'to the almost total exclusion of those whose means or influence was not so great as to obtain limits.'

"There was here a remarkable instance of men of high position descending to meddle with other people's affairs, and being thereby led to commit themselves to vulgar errors on matters of which they were themselves wholly ignorant.

"It will be seen that in the above they asserted two distinct grievances as the cause of the monopoly they complained of; first, that those without a certain amount of means could not obtain "limits" or timber berths; and, second, that (failing means) they might be obtained by influence. The first must indeed be admitted. Men of means will acquire timber berths, as well as houses and lands and ships, to the 'exclusion of those whose means are not so great as to obtain them'; it is an old grievance for which governments have not yet found a remedy.

"And even if, at the suggestion of these memorialists (who, by the way, were not of the class who usually advocate such a doctrine), the government had taken, or should yet take, some undefined way of throwing the timber berths into the hands of those who have not means to obtain them in a legitimate manner, those who possess means would (provided the tenure justified the investment) immediately buy them out, and then there would be the same cry for a repetition of the operation.

"With respect to the second grievance, it is sufficient to say that it is not to be found in the law or the regulations affecting the trade; and as it could only exist in violation of both, the memorialists should have established the fact before they claimed credit for it as such, whereas they did not attempt to substantiate even one case of such violation.

"They suggested, in conclusion, that if the license holders were unable or unwilling to pay, etc., their timber berths should be thrown open to competition, and they, the memorialists, believed that, nothwithstanding the depressed state of the trade at that time, they would be readily taken by others without loss to the revenue.

"It is difficult to write seriously on such a proposition; there can be no doubt that if the opportunity had occured and had been taken advantage of to submit to public competition, privileges which have already been in many cases dearly bought, and in the development of which on the whole, hundreds of thousands of pounds of private means have been expended (as shown by returns laid before Parliament in 1852), they would readily be taken without loss to the revenue, but it was an issue not more reasonable nor likely than that the ships of the memorialists would have been made available to the revenue if they had asked for a change in the navigation laws.

"Such was the false position assumed by the shipping interest at the period referred to, but the erroneous grounds upon which they opposed the prayer of the producing merchants of course made no argument either for or against the latter, which had to be dealt with upon its own merits.

"The memorial of the producing merchants was signed by some of the shipping merchants also, who are connected with or interested in the business of the producers and there appeared to be two or three firms, not known to the department to be connected with the producing interest, who signed, it is presumed, in a liberal view of what they conceived to be for the good of the country and the trade at large: some merchants and others at Ottawa had also joined in it, who are not personally engaged in the trade, but whose interests are bound up with those of the producers.

"The object of the memorialists as expressed, was to obtain a cessation for three years, or until the then existing depression had passed away, of the penalty imposed for non-occupation of timber berths. Although the object sought was professedly of a temporary nature, however, it would no doubt have been made a precedent for seeking government interference in every fluctuation of the trade thereafter. It would have been the first precedent that could be quoted since the adoption of the new system, and therefore I shall state the reasons that induced its rejection, as I conceive that upon the integrity of the system being maintained in the future depends much of the prosperity of the trade.

"It is to be observed that when the great depression occurred in the trade, which began in 1846, and from which it was about four years before it could be said to have recovered, the ground rent system was not in force. The license holders were at that time subject only to the payment of the amount of duty accrued on the quantities cut; they were then as now obliged to occupy every year, but under pain of forfeiture of the right to renewal of license instead of the penalty of an increased payment.

"It was complained of this system that it favored monopoly, inasmuch as a berth could only be proved unoccupied at a very heavy expense, and then it was still subject to be repurchased by the former holder. The standard of occupation (that is the quantity required to be cut to constitute occupation) was in 1845-46 made too high, thereby having a tendency to force production. In obedience to the cry of monopoly, then prevalent, notice was also given by the department, about the same time—there being then no statute upon the subject—that all the larger timber berths would be sub-divided in three years; this also, although never actually effected, had a tendency to force production, as license holders were naturally desirous of making the most of their berths by cutting off all the best timber in the interim.

"Parties differed in opinion as to the exact amount of influence these rules exercised upon the over-production, but it was generally admitted that they exercised some influence in that way. At all events the result of the ruinous state of the trade was that the government did afford relief in these particulars, the notice of sub-division was withdrawn, the standard of occupation was reduced, and finally the parties were allowed from year to year up to 1850 to hold their timber berths without any condition of occupation at all, and without any payment where they did not choose to occupy.

"The action of the government on the trade, during the periods of great prosperity and succeeding depression referred to, was thus in opposite extremes. It therefore became expedient that a better permanent system of regulations should be framed for the government of the trade, and the regulations of which the ground-rent system is a part were finally the result.

"By this system an annual ground-rent was imposed on timber berths, in excess of the duty, as a regular permanent charge, and as a check upon monopoly it was provided, by way of penalty, that the ground-rent should double upon each renewal of license on berths which had not been occupied during the preceding season, and continue doubling every year, so long as the berths continued unoccupied. Thus the rent paid for the largest size of berth the regulations permit—in excess of all other charges—is £6 5s., the same being payable annually.

"But upon non-occupation for one season the rent rises to £12 10s.—upon non-occupation for a second season to £25, for a third season to £50—and so on (as the system was first introduced) without limit, but reverting to the origina rate of £6 5s. whenever occupation recommenced.

"For the first few years after the introduction of this system it could not

force production to any very sensible extent; but the constant increase, in geometrical progression, at last comes to a point when the increase is so great and sudden that those who held any timber berths in reserve had either to occupy or relinquish them. Unfortunately as regards the great bulk of the license holders, the operation of the system had just reached the point (when they had either to produce more timber or relinquish that which they had already paid a series of rents for, and in some instances, otherwise laid out money upon, without return) at a moment when the trade was in a state of considerable depression, and required a decreased instead of an increased production. This state of depression, too, arose from causes wholly foreign to the internal management of the trade; for it differed from the previous great crisis in the trade (that of 1846-47, etc.) in this, that it arose less from an excessive production than from a sudden cessation of demand—the result probably of the war then raging. It differed also in degree, bearing only the character of a temporary embarrassment as compared with the wide spread-ruin which fell upon the trade on the former occasion. It was none the less necessary, however, to apply a remedy, if practicable, in time, and it was in this view that the producers sought to be temporarily authorized to suspend productions where the ordinary tendency of the regulations was to enforce it.

"It was not, therefore, as put by the opponents of the producing interest, a question of the holders of timber berths fulfilling or failing in their obligations; and even if it had been so, the maintenance of the penalty in its full force would not, at least for some time, have compelled any considerable relinquishment of licenses; on the contrary, the parties would have continued to hold them, and endeavored by extended operations to reduce to their original amounts the ground rents on such berths as the penalty had most accumulated upon, thus risking the consequences of increased production rather than abandon their licenses.

"The real question at issue, therefore, simply was, whether the penalty for non-occupation had been made too severe or not.

"But there was also the question of whether the exceptional circumstances then existing, arising out of the war or otherwise, were such as would justify the temporary suspension of the penalty.

"On the first head, as regards the penalty for non-occupation generally, it is to be observed that, if any regulation were to succeed in compelling the occupation of all the lands licensed, it would force a production far beyond the requirements of the trade; no regulation could permanently have this effect, however, as the result of an excessive penalty would be to cause the relinquishment of a portion of the territory now under license, which (apart from the question of whether it would not afford, in every period of excitement, too great a facility for a rush into the trade) would leave a portion of the timber lands wholly unproductive, either in ground rents or duties, which now afford a very considerable revenue.

"The system of regulations for the granting of licenses to cut timber began by a course of trial and error and has gradually been perfected by experience.

"The ground-rent system was a trial; it has proved a most happy and successful one, which has given general public satisfaction to the trade, but it would be too much to pretend that, in the first trial there had been no error, that it had been perfected at once without any experience of it practically.

"In the introduction of the system the then remote contingency was not provided for, that if no limit was set to the ultimate amount the ground-rent might reach, great hardships might in some cases be the result; such, for instance as might arise in case of several timber berths being taken up in a previously inaccessible locality, assuming in such a case that the license holders (joining together for that purpose) proceed to improve the stream (as is frequently done

to the extent of many thousand pounds), lay out all the means they can command in the operation, and before the rents have reached an excessive amount are enabled to occupy the lower berths; but some pressure then comes, they cannot push their improvements immediately to the upper berths, and the ground rents arrive at a point where they compel relinquishment, while they could not compete for the repurchase on equal terms with any new purchaser who would have the advantage of their outlay.

"It has been suggesetd that a remedy for this might be found by admitting improvements in lieu of occupation, which would be just in principle but practically extremely difficult of application.

"The cases urged upon the department from every part of the country would be numerous, the evidence to be adjudicated upon would be entirely *ex parte*, the exact nature of the improvements to be admitted would always be a matter of dispute, and, however honestly administered, the system would give rise to constant accusations of partiality and favor.

"Upon a full consideration, therefore, of all the circumstances it appeared that the difficulty might be met by a general rule calculated to perfect and give permanency to the system as a whole instead of impairing it.

"A rule was accordingly adopted which consists in limiting the extreme amount of ground rent on any berth to a sum equal to what the berth would produce in duty if duly occupied, the rent remaining at that rate per annum till occupation commences; reverting then, of course, to the original rate as before. This, while it entails a heavy payment on those who reserve berths for future use, as much in fact as they would have to pay for the timber if they cut it, affords no public ground for complaint, for the public get the price of the timber annually while the timber itself remains, with the public interest in it, for future revenue, unimpaired; at the same time it prevents the system from becoming oppressive, and therefore, inoperative, as all oppressive laws ultimately become.

"On the other head, with regard to the temporary suspension of the system the same issue as was then involved is now at stake and must continue to be so, It must be remarked, as a general rule, that any departure, for partial, local, or temporary causes, from the fixed laws affecting the trade, is bad in principle and calculated in every case to produce a bad effect.

"If, when a depression has arisen from over-production, or other causes, which the trade has brought upon itself, the government should once step in to affect the market or the supply, directly or indirectly, the same interference would be looked forward to again, and induce an over-speculative spirit in time of prosperity, sure to end in a similar result. If the government were at any time to relax the conditions it has seen fit to impose upon the holders of unoccupied timber berths without some other cause than the ordinary fluctuations of the trade, public confidence would be shaken either in the efficacy of the system itself or in the administration of it. Nothing but the strongest necessity, arising from causes foreign to the trade itself, could at any time justify an exception to this as a general rule, and the only question on this point worthy of consideration at that time was, whether the effects of the then state of war were such as to justify its being made an exceptional case.

"In considering this question it became necessary to take a retrospective view of the trade for some years, from which it appeared that there had not been any very excessive supply in the Quebec market as compared with the export. The supply was indeed somewhat excessive in 1852 and the stock of square timber on hand at the close of that year(18,151,750 feet) was also excessive, but the producers—profiting from the sad experience of 1846 and the embarrassments of succeeding years—having cautiously limited their operations, the supply was

much less in 1853, and the stock on hand (12,632,929 feet) at the close of the season greatly reduced. But from the great demand these were years of great prosperity to the producing interest, and consequently an impetus was given to the supply produced in 1854, which was very great; but the export was also greatly increased and the stock in hand at the close of the season (13,465,602 feet) though large, yet with the more limited production for 1855 was not at all such as seriously to embarrass the trade had the usual demand existed. From whatever cause, however, the demand had greatly diminished, for at the time the subject was most strongly pressed upon the government, say 2nd July, 1855, the tonnage arrived in Quebec, from sea, was 121,778 tons against 240,021 tons to the same period of the previous year; and at the close of the year 346,449 tons against 580,323 tons the previous year; and in like manner, the quantity of square timber exported in 1855 was 15,389,774 feet against 25,346,800 feet in 1854. There is a defect in the present law which prevents the statistics being got so correctly in respect of deals. There is also a large quantity of timber usually absorbed in ship-building and exported in that shape, in which there had also been a falling off. The result of a full investigation of the subject, however, was to show that the trade was on the whole in a healthy condition, and that the depression at that period was only temporary, for although there had been no excessive production for some years previous, as compared with the export, the export itself had been great, having been gradually increasing till it produced a temporary glut, not in the Quebec market but in the English markets, which had precisely the same effect, and which was in some degree aggravated no doubt by a diminished consumption resulting from the war and the tightness of money matters consequent thereon.

"The prayer of the memorialists, therefore, to be authorized to suspend their operations for three years without incurring the penalty of increased rent, as provided by the regulations for non-occupation, was refused, for if even such an extreme case could arise, there did not then appear to be any cause operating to produce such permanent embarrassment as would have warranted the government in interfering with the integrity of a system which had, so far, been found to give stability to the trade and satisfaction to the public.

"The result has justified the course pursued; the export in 1856 having been nearly up to the average, or 3,919,378 feet, (equal to forty-six million inch board measure) in excess of the previous year. The season was in fact, upon the whole a very fair one, both for the producer and the shipper, and this without any such extreme measure on the one side or the other as the government had been asked the year before, to adopt for the safety of the trade.

"The only change adopted was one which had not an immediate effect; it consisted, as already stated, in making the ground rent on unoccupied berths cease to increase when it had reached the extreme amount which ground rent and the dues accruing on timber cut would both amount to upon a berth which was occupied. The public could scarcely ask more, as a protection against monopolizing timber berths, than that the parties who do so should be made to pay for the timber when they don't cut it the same as when they do cut and carry it to market.

"In former years more stringent laws were made against holding timber berths unoccupied, but the result was, as has already been seen, that when the crisis came, the government always gave way, thus proving that extreme measures are always the least effective, while they lead in matters of trade to uncertainty and fluctuation.

"I have entered thus at length into the circumstances attending the appeal of the opposing interests to the government in 1855, because there was then undoubt-

edly serious apprehension entertained by many that a time of great embarrassment and difficulty was at hand ; while a crisis had actually arrived in regard to testing the efficacy of the by-laws by which the trade is governed, so far as it is as a whole affected by the operations on public lands ; and because, therefore, the action then taken has so far solved a difficult problem and is likely to exercise a permanent influence on the trade."

As modified by experience, the management of the timber interests upon the public lands in the later years of the former Canadian Government was in charge of the Commissioner of Crown Lands, who was authorized to grant licenses for cutting timber upon ungranted lands at such rates, and subject to such regulations as might be established from time to time by the Governor-in-Council and of which notice was given in the *Canada Gazette*. These licenses were granted for a period not exceeding twelve months, and obliged the lessees to make returns at the expiration of the lease, showing the number and kinds of trees cut, and the quantity and description of saw-logs, or of the number and description of sticks of square timber manufactured and carried away under such license, which statement must be verified by affidavit before a justice of the peace. The Crown dues were a claim upon the timber or any part thereof, wherever found, and whether in the original logs or made into deals, boards or other stuff, and which might be seized and detained wherever found until the dues were paid.

Persons cutting, or causing to be cut, any timber on any of the Crown, clergy, school, or other public lands, or removing, or inducing, or assisting in the removal of timber thus cut without authority, acquired no right or claim for cutting or preparing for the market, but the whole became forfeited, and if the timber or saw-logs had been removed out of the reach of the officers of the Crown lands department, or if it was found otherwise impossible to seize the same, the person was liable in addition to the loss of his labor and disbursements, to a forfeiture of $3 for every tree (rafting stuff excepted) that might be proved to have been cut, to be recovered with costs of suit, in the name of the Commissioner of Crown Lands or resident agent in any court having jurisdiction in civil matters to the amount of the penalty. In all such cases it was incumbent on the party charged to prove his authority to cut, and the averment of the party seizing or prosecuting that he was duly employed under the timber act was to be received as sufficient proof, thereof, unless the defendent proved to the contrary.

Seizures might be made upon information supported by affidavit. If the timber illegally cut had been mixed with other timber, the whole might be detained until satisfactorily separated by the holder. Resistance to an officer or authorized agent, by assault, force, or violence, or by threats of such, was made a felony, and the carrying away of timber under seizure, whether openly or secretly, and whether with or without force or violence, was deemed stealing and rendered the person liable to punishment for felony. Whenever any timber was seized for the non-payment of Crown dues, the burden of proof of payment, or as to the land on which it was cut, was to rest on the claimant of such timber and not on the officer making the seizure or the party bringing the prosecution.

Timber seized was to be deemed to be condemned at the end of thirty days and publication of notice, unless the person claiming, sooner notified the nearest officer or agent of the Crown land office that he intended to prove his claim.

Any judge of competent jurisdiction might order the release of timber under seizure upon receiving from the alleged owner a bond with two good and sufficient sureties, first approved by the agent, for double the value of the timber in case of condemnation, such bond being taken in the name of the

Commissioner of Crown Lands, and to be delivered and kept by him until the claim was released or paid. Every person availing himself of any false statement or oath to evade the payment of Crown dues forfeited the timber on which dues were attempted to be evaded.

The malicious cutting or loosening of a boom, or the cutting loose or breaking up of a raft or crib, was made punishable by fine and imprisonment of not less than six months.

Such in brief was the system formerly in force. That it did not insure the forests upon the Crown lands from pillage and waste by lumbermen is sufficiently proved by the following statement made by the Commissioner of Crown Lands of the Province of Ontario, in 1877 in describing the system of supervision then in use and the abuses that had been formerly practiced.

"Previous to confederation, the guardianship of the forests as regards surveillance over the cutting of timber under license or in trespass on lands of the Crown was so ineffective or attended to with such laxity as to be in fact no guardianship at all, and pillage to a large extent was carried on almost with impunity; the seat of government was peripatetic,* and the agents of the Crown Lands Department for the collection of timber dues were located at certain points where returns were brought to them of such operations as parties chose to make, on which dues were paid, and the amount received with statement of timber, etc., on which it was paid, transmitted monthly to the department without any actual knowledge of or check on the extent of cutting; these returns and moneys were received at headquarters without comment or inquiry, and the one debited to the agent and the other placed to his credit."

AMOUNTS ACCRUED AND COLLECTED FOR TIMBER DUES, GROUND RENTS, AND BONUSES IN UPPER AND LOWER CANADA, DURING THE YEARS PRECEDING THE FORMATION OF THE DOMINION GOVERNMENT.

Years.	Accruals.			Collections.		
	Upper Canada.	Lower Canada.	Total.	Upper Canada.	Lower Canada.	Total.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1857	135,310 64	120,797 96	256,108 60	94,921 15	114,023 53	208,944 68
1858	111,739 62	111,081 53	222,821 15	141,185 90	134,476 00	275,661 90
1859	140,409 96	142,071 97	282,481 93	136,189 33	145,745 59	281,934 92
1860	176,400 39	168,973 36	345,433 75	149,921 22	168,330 38	318,252 60
1861	156,253 57	154,101 38	310,354 95	127,995 88	127,849 10	255,844 98
1862	143,357 59	136,830 79	280,188 38	159,330 86	144,321 31	303,652 17
1863	170,160 12	157,484 72	327,644 84	197,093 73	189,562 80	386,656 53
1864	188,171 74	155,793 97	343,965 71	121,367 79	121,718 52	243,086 71
1865	146,079 67	151,034 24	297,113 91	183,380 75	160,035 23	343,415 98
1866	203,040 46	166,036 54	369,077 00	197,965 85	138,678 05	336,643 89
Total 10 years.	1,570,983 76	1,464,206 46	3,035,190 22	1,509,352 46	1,444,740 50	2,954,092 96

* For some years before the union of 1867 the seat of government of Canada alternated between Toronto and Quebec. It had previously been located at Montreal, and at a still earlier period at Kingston.

RECEIPTS FROM BONUSES AND GROUND RENTS ALONE, DURING THE UNION OF THE PROVINCES OF CANADA, SO FAR AS THESE HAVE BEEN PUBLISHED.

Fiscal years.	Amount.
1856-'57	$244,112 90
1957-'58	203,263 59
1858-'59	276,741 16
1859-'60	316,983 35
1860-'61	290,933 04
1861-'62	283,383 31
1862-'63	309,252 15
1863-'64	325,294 51
1864-'65	324,535 61
1865-'66	300,486 18
1866-'67	369,800 53

RECENT AND EXISTING TIMBER REGULATIONS IN CANADA.

(*a*) *Dominion Lands.*—These lands, in Manitoba and the North-west Territories, are in charge of the Department of the State and a division thereof styled "The Dominion Land Office." The act under which they are administered was assented to April 14th, 1872. The surveys are conducted by the Surveyor-general and his deputies, and there are various agents concerned in the duties incident to this interest.

The system of surveys is by townships six miles square, sub-divided into sections of one mile square each, unless this arrangement is modified by the divergence of meridians, irregularities in previous surveys, or other causes. There is an allowance of one chain and fifty links between all townships and sections for roads. The townships are numbered northward from the international boundary, or the forty-ninth degree north latitude, and in Manitoba, east and west from a principal meridian, ran in 1869, that strikes this line of latitude about ten miles west of Pembina. The sections are numbered from one to thirty-six in each township, beginning at the south-east corner and running alternately from east to west and from west to east, so that the last number shall be in the north-east corner. In this the order of numbering is just the reverse of that employed on the surveys of public lands in the United States. Sections eleven and twenty-nine in each township are reserved for education.

The sections are divided into sixteen squares of forty acres each, numbered in the same way as the sections in townships, beginning at the south-east corner. The lines running north and south are designed to be true meridians, and those running east and west are chords intersecting circles of latitude passing through the angles of the townships.

The terms and conditions of the deed of surrender from the Hudson Bay Company stipulated a reservation of one-twentieth part of the portion described as the "fertile belt," which rendered it necessary to modify the general plan, and in the prairie region, where there are islands or belts of timber, a special mode of sub-division was provided, with the view of affording benefit to the greatest possible number of settlers, and for the prevention of petty monopolies. In these cases the woodlands are surveyed into lots of not less than ten nor more than twenty acres each, so as to afford one wood-lot to every quarter-section of prairie farm in each township. This, however, is not allowed to interfere with the sections set apart for schools, nor to those set apart and vested in the Hudson Bay Company. Each wood-lot is required to front on a section road-allowance.

In case an island or belt of timber come entirely within a quarter-section, or in several quarter-sections so that not more than twenty-five acres shall be included in each, it is not to be separately surveyed into wood-lots. These wood-lots are conveyed as homestead grants the same as other lands, but the grantee is not allowed to sell any of the timber on his lot to any saw-mill owners, or to any other than settlers for their own private use, under penalty of prosecution, as for trespass. Upon conviction they may be fined or imprisoned, or both, and they further forfeit their claims absolutely.

Any tract of land covered by forest timber may be set apart as timber lands, and reserved from sale and settlement; and except as it may be thought expedient by the secretary of State to divide a township into two or more timber limits, the several townships composing any such tracts shall each form a limit. The word "timber" is used to designate all lumber, and all products of timber, including firewood and bark.

Leases for cutting timber may be granted for twenty-one years, and upon the following conditions:—

1. The lessee to erect a saw-mill or mills in connection with such limit and lease, and subject to any special conditions which may be agreed upon and stated in the lease, such mill or mills to be of capacity to cut at the rate of a thousand feet, board measure, in twenty-four hours, for every two-a-half square miles of limits in the lease, or shall establish such other manufactory of wood goods as may be agred upon as the equivalent of such mill or mills, and the lessee to work the limit in the manner and to the extent provided in the lease within two years from the date thereof, and during each succeeding year of the term.

2. To take from every tree he cuts down all the timber fit for use, and manufacture the same into sawn lumber, or some other such saleable product as may be provided in the lease, or by any regulations made under this act.

3. To prevent all unnecessary destruction of growing timber on the part of his men, and to exercise strict and constant supervision to prevent the origin or spread of fires.

4. To make returns to the government monthly or at such other periods as may be required by the secretary of State, or by regulations under this act, sworn to by him or by his agent or employee cognizant of the facts, declaring the quantities sold or disposed of as aforesaid, of all sawn lumber, timber, railway-car stuff, ship-timbers and knees, shingles, lath, cordwood or bark, or any other product of timber from the limit, in whatever form the same may be sold or otherwise disposed of by him during such month or other period, and the price or value thereof.

5. To pay in addition to the bonus an annual ground rent of $2 per square mile, and further a royalty of five per cent. on his monthly account.

6. To keep correct books, of such kind and in such form as may be provided by his lease, or by the regulation under this Act, and to submit the same for the inspection of the collector of dues whenever required, for the purpose of verifying his returns aforesaid.

7. The lease shall describe the lands upon which the timber may be cut, and shall vest in the lessee during its continuance the right to take and keep exclusive possession of the lands so described, subject to the conditions hereinbefore provided or referred to, and such lease shall vest in the holder thereof all right of property whatsoever in all trees, timber, lumber, and other products of timber cut within the limits of the lease during the continuance thereof, whether such trees, timber, and lumber or products be cut by authority of the holder of such lease, or by any other person, with or without his consent; and such lease shall entitle the lessee to seize in replevin, revendication, or otherwise, as his

property, such timber, where the same is found in the possession of any unauthorized person, and also to bring any action or suit at law or in equity against any party unlawfully in possession of any such timber, or of any land so leased, and to prosecute all trespasses thereon, and such other offenders as aforesaid, to conviction and punishment, and to recover damages, if any; and all proceedings pending at the expiration of any such lease may be continued and completed as if the lease had not expired.

8. Such lease shall be subject to forfeiture for infraction of any one of the conditions to which it is subject, or for any fraudulent return; and in such case, the secretary of State shall have the right, without any suit, or other proceeding at law or in equity, or compensation to the lessee, to cancel the same, and to make a new lease, or disposition of the limit described therein to any other party at any time during the term of the lease so canceled: provided, that the secretary of State, if he sees fit, may refrain from forfeiting such lease for non-payment of dues, and may enforce payment of such dues in a manner hereinafter provided.

9. The lessee who faithfully carries out the above conditions shall have the refusal of the same limits, if not required for settlement, for a further term not exceeding twenty-one years, on payment of the same amount of bonus per square mile as was paid originally, and on such lessee agreeing to such conditions and to pay such other rates as may be determined on for such second term.

It was further provided that any ground rent, royalty, or other dues to the Crown not paid when falling due, should bear interest at six per cent until paid, and be a lien on any timber cut within the limits. After three months' neglect, the Crown timber agent might seize so much of the timber cut as would be necessary to pay the claim and expenses, and sell the same at public auction, paying over to the lessee or owner of the timber any balance left after paying claims and costs.

In case the payment of the Crown dues was evaded by removal of the timber or products out of Canada, or otherwise, the amount due might be charged upon any other timber cut on Dominion lands by the same lessee or by his authority, or the claim might be recovered by action at law, in the name of the secretary of State, or his resident agent, in any court having jurisdiction in civil cases to the amount claimed.

The secretary of State was empowered to take bonds or promissory notes for any money due to the Crown, interest and costs, or for double the amount of all dues, fines and penalties, and costs, incurred or to be incurred, and he might then release any timber upon which the same would be leviable, whether under seizure or not; but the taking of such bonds was not to affect the lien and right of the Crown to enforce payment of such money on any other timber cut on the same limit, if the sums for which such bonds or notes were given should not be paid when due.

The penalties imposed for cutting timber without authority were forfeiture of the timber cut, and a fine not exceeding $3 for every tree cut or carried away, with costs. In such cases the burden of proof of authority to cut and take the timber was to be upon the party charged, and the averment of the party seizing or prosecuting that he is duly employed under this Act was to be sufficient proof thereof, unless the defendent proved to the contrary.

Upon information, supported by affidavit, that timber had been cut without authority on Dominion lands, and describing where the same can be found, or upon information to a Crown officer or agent as to such cutting without authority, the officer or agent was authorized to seize the timber and place it under custody until a decision could be had by competent authority.

If timber, cut without authority, has been made up with other timber into a crib, dram, or raft, or in any other manner mixed up with other timber, so that it cannot be identified, the whole of the timber so mixed is to be liable to seizure and forfeiture until satisfactorily separated by the holder. Timber held under seizure may be released upon sufficient security for the payment of its full value or of double the amount of all dues, fines, penalties, and costs, incurred or imposed thereon.

The penalties for resisting seizure, or removing timber after it was seized, were prescribed and proceedings therein specified. No sale or grant of Dominion lands was to give any title to any slide, dam, pier, or boom, previously erected upon it, unless expressly mentioned in letters patent, or other instrument establishing such sale or grant. The free use of such works was not to be interrupted, and the right of passing and repassing on either side, whenever necessary for use, and at portages, was reserved.

The Dominion Lands Act makes provision for military bounties, homestead entries, leases for grazing, and hay-cutting, mining, etc., and for direct sales of land.

(*b*) *Crown lands of Ontario.*—The timber Act now in force was passed in 1860, and is found as Chapter 28 of the Revised Statutes of Ontario, 1887. It is as follows:—

(1) An Act Respecting Timber in Public Lands.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1.—(1) The commissioner of Crown lands, or any officer or agent under him authorized to that effect, may grant licenses to cut timber on the ungranted lands of the Crown, at such rates, and subject to such conditions, regulations and restrictions as may from time to time be established by the Lieutenant-Governor-in-Council, and of which notice may be given in the *Ontario Gazette*.

(2) No license shall be so granted for a longer period than twelve months from the date thereof; and if, in consequence of incorrectness of survey, or other error, or cause whatsoever, a license is found to comprise lands included in a license of a prior date, the license last granted shall be void in so far as it interferes with the one previously issued, and the holder or proprietor of the license so rendered void shall have no claim upon the Government for indemnity or compensation by reason of such avoidance.

2. The licenses shall describe the lands upon which the timber may be cut, and shall confer, for the time being, on the nominee the right to take and keep exclusive possession of the lands so described, subject to such regulations and restrictions as may be established:—And the licenses shall vest in the holders thereof all rights of property whatsoever in all trees, timber, and lumber, cut within the limits of the license during the term thereof, whether the trees, timber, and lumber, are cut by authority of the holder of the license, or by any other person, with or without his consent; and the licenses shall entitle the holders thereof to seize in revendication or otherwise, such trees, timber, or lumber, where the same are found in the possession of any unauthorized person, and also to institute any action against any wrongful possessor or trespassers, and to prosecute all trespassers and other offenders to punishment, and to recover damages, if any; and all proceedings pending at the expiration of any license may be continued to final determination, as if the license had not expired.

3. Every government road allowance included in any Crown timber license, heretofore granted, or which may hereafter be granted, under section 1 of this Act, shall be deemed and taken to be and to have been ungranted lands of the Crown, within the meaning of said section, and liable, as such, to be included in the license.

4. The licensee or nominee named in any license shall be deemed and taken to have, and to have had, all the rights in respect of every such road allowance, and the trees, timber, and lumber thereon, or cut thereon, as were, or, by the section 2 of this Act, may be conferred upon him, in respect of any other Crown lands embraced in such license, and the trees, timber, and lumber thereon, or cut thereon, except that he shall not be entitled to take or keep exclusive possession of such road allowance.

5. No by-law passed, or to be passed by any municipal council for preserving, selling, or otherwise appropriating or disposing of the timber or trees, or any part thereof, on a government road allowance or allowances included in any such license, shall be deemed or taken to have had or have any force or effect against any such license.

6. In case the council of any townships, organized as a separate municipality, or the council of any united townships, have passed, or hereafter pass, any by-law for preserving or selling the timber or trees on the government road-allowances within such township or within the senior township of united townships, and included in any such license, the corporation of such township or united townships shall be entitled to be paid out of the consolidated revenue fund of this Province a sum equal to two per centum of the dues received by Her Majesty for or in respect of the timber and saw-logs which, during the existence of the by-law, were cut within the township or united townships, under the authority of the license; but no corporation shall be entitled to such percentage of the dues received for timber or saw-logs cut during the times or seasons when timber, or trees on any such road allowances were cut or removed, for which cutting or removal the corporation had, before the fifteenth day of February, one thousand eight hundred and seventy-one, obtained a verdict against any such licensee or nominee.

7. No municipal corporation shall be entitled to such payment as aforesaid, unless a certified copy of the by-law passed, or to be passed as aforesaid, accompanied by an affidavit of the clerk or reeve of the corporation, verifying the copy, and the date of the passing of the by-law, is filed in the Department of Crown Lands at Toronto within six months from the passing of the by-law; and the affidavit may be made or taken before any person or officer who, under sections 42 or 43 of "The Public Lands Act," is authorized to take the affidavits in those sections mentioned.

8. All moneys to be paid as aforesaid, to any municipal corporation shall be expended in the improvement of the highways situate within the township or within the senior or junior township in respect of which such moneys were paid.

9. The percentage to which the junior township or townships of such united townships may be entitled, shall only be in respect of the dues received upon timber or trees which shall be cut after the 30th day of April, 1881. (See Rev. Stat. Ont., c. 25, ss. 13-15, as to the right of the Crown to grant timber licenses on Free Grant Lands.)

10. Every person obtaining a license shall, at the expiration thereof, make to the officer or agent granting the same, or to the Commissioner of Crown lands, a return of the number and kinds of trees cut, and of the quantity and description of saw-logs, or of the number and description of sticks of square timber manufactured and carried away under the license; and the statement shall be sworn to by the holder of the license, or his agent, or by his foreman, before a Justice of the Peace; and any person refusing or neglecting to furnish such statement, or evading or attempting to evade any regulation made by order-in-council, shall be held to have cut without authority, and the timber made shall be dealt with accordingly.

11.—(1) All timber cut under licenses shall be liable for the payment of the Crown dues thereon, so long as and wheresover the timber or any part of it may be found in Ontario, whether in the original logs or manufactured into deals, boards or other stuff: and all officers or agents intrusted with the collection of such dues may follow all timber and seize and detain the same wherever it is found until the dues are paid or secured.

(2) Nothing in this Act contained shall be construed to repeal the provisions of the section 4 of chapter 23 of the Consolidated Statutes of Canada, as regards timber removed into the Province of Quebec.

12. Bonds or promissory notes taken for the Crown dues either before or after the cutting of the timber, as collateral security, or to facilitate collection, shall not in any way affect the lien of the Crown on the timber, but the lien shall subsist until the dues are actually discharged.

13. If timber so seized and detained for non-payment of Crown dues remains more than two months in the custody of the agent or person appointed to guard the same, without the dues and expenses being paid, the Commissioner of Crown Lands with the previous special sanction of the Lieutenant-Governor in council, may order a sale of the said timber to be made after sufficient notice; and the balance of the proceeds of the sale, after retaining the amount of dues and costs incurred, shall be handed over to the owner or claimant of the timber.

14.—(1) If any person without authority cuts or employs or induces any other person to cut, or assists in cutting any timber of any kind on the Crown, clergy, school or other public lands, or removes or carries away, or employs or induces or assists any other person to remove or carry away, merchantable timber of any kind so cut from the public lands aforesaid, he shall not acquire any right to the timber so cut, or any claim to any remuneration for cutting, preparing the same for market, or conveying the same to or towards market.

(2) When the timber or saw-logs made has or have been removed by any person out of the reach of the officers of the Crown lands department, or it is otherwise found impossible to seize the same, such person shall, in addition to the loss of his labor and disbursements, forfeit a sum of $3 for each tree (rafting stuff excepted) which he is proved to have cut or caused to be cut or carried away.

(3) Such sums shall be recoverable with costs, at the suit and in the name of the Commissioner of Crown lands or resident agent, in any court having jurisdiction in civil matters to the amount of the penalty.

(4) In such cases it shall be incumbent on the party charged to prove his authority to cut; and the averment of the party seizing or prosecuting that he is duly employed under the authority of this Act, shall be sufficient proof thereof, unless the defendant proves the contrary.

15. Where satisfactory information, supported by affidavit made before a justice of the peace or before any other competent party, is received by the Commissioner of Crown Lands, or other officer or agent of the Crown Lands Department, that any timber or quantity of timber has been cut without authority on Crown, clergy, school or other public lands, and describing where the timber can be found, the Commissioner, officer or agent, or any one of them, may seize or caused to be seized in Her Majesty's name the timber so reported to be cut without authority, wherever it is found, and place the same under proper custody until a decision can be had in the matter from competent authority.

16. Where the timber so reported to have been cut without authority on the public lands has been up with other timber into a crib, dram, or raft, or in any other manner has been so mixed up at the mills or elsewhere as to render it impossible or very difficult to distinguish the timber so cut on public lands without license from other timber with which it is mixed up, the whole of the timber so mixed shall be held to have been cut without authority on public lands, and shall be liable to seizure and forfeiture accordingly, until satisfactorily separated by the holder.

17. Any officer or person seizing timber, in the discharge of his duty under this Act may, in the name of the Crown, call in any assistance necessary for securing and protecting the timber so seized.

18. Whenever any timber is seized for non-payment of Crown dues, or for any other cause of forfeiture, or any prosecution is brought for any penalty or forfeiture under this Act, and a question arises whether the said dues have been paid on such timber, or whether the timber was cut on other than the public lands aforesaid, the burden of proving payment, or on what land the timber was cut, shall lie on the owner or claimant of the timber, and not on the officer who seizes the same or the party bringing the prosecution.

19. All timber seized under this Act shall be deemed to be condemned, unless the person from whom it was seized, or the owner thereof, within one month from the day of the seizure, gives notice to the seizing officer or nearest officer or agent of the Crown lands office, that he claims or intends to claim the same; failing notice, the officer or agent seizing shall report the circumstances to the Commission of Crown Lands, who may order the sale of the said timber by the officer or agent, after a notice on the spot of at least thirty days.

20.—(1) Every judge having competent jurisdiction may, when he deems it proper, try and determine such seizures, and may order the delivery of the timber to the alleged owner, on receiving security by bond, with two good and sufficient sureties to be first approved by the agent, to pay double the value in case of condemnation.

(2) The bond shall be taken in the name of the Commissioner of Crown Lands to Her Majesty's use, and shall be delivered up to and kept by the Commissioner.

(3) If the seized timber is condemned, the value thereof shall be forthwith paid to the Commissioner of Crown Lands or the agent, and the bond cancelled, otherwise the penalty of such bond shall be enforced and recovered.

21. Every person availing himself of any false statement or oath to evade the payment of Crown dues, shall forfeit the timber on which dues are attempted to be evaded.

(2)—Management of the Timber Lands of Ontario.

Previous to June 13th, 1866, applications for license to cut timber on the Crown lands were made to the several Crown timber agents, who might grant such privileges upon payment at the rate of 2s. 6d. ($0.50) per square mile annually, payable in advance. These leases expired on the 30th of April in each year, and might be renewed before the 1st of July following. The changes since introduced are described by the Commissioner of Crown Lands in a statement prepared for the information of the then Premier of the Province of Quebec in 1877, a manuscript copy of which has been furnished us, as follows: On the 13th of June, 1866, prior regulations were superseded, and the clause respecting licenses to cut timber was modified, so that instead of agents granting them on application it was provided that such vacant berths as the Commissioner of Crown Lands saw fit should be offered at public auction, to be held half-yearly in each timber agency on the 10th of July and 10th of January, or such other dates as the Commissioner might think proper to fix by public notice, at an upset price of $4 per square mile, or such rate as he might fix by such notice, the berths to be awarded to the highest bidder, etc., in addition to the yearly ground rent of fifty cents per mile and tariff dues on timber when cut, the Commissioner or agent in the intervals between sales to grant licenses on application on payment of the bonus and ground rent mentioned.

The Regulations of 1851 and those of 1866 imposed a fine for non-occupation of timber berths as follows: If a berth in surveyed territory had not been occupied, *i.e.*, worked upon during the season for which license was granted or renewed, or in unsurveyed territory the year after granting or renewal of license, the ground rent of fifty cents was doubled, and so on in case of non-occupation until the ground rent reached 23s. 4d. ($4.67), or maximum charge per square mile, at which rate it stood till the berths had been worked upon, on which the rent fell again to fifty cents per mile; the making of an average of 500 feet of square timber, or twenty saw-logs to the mile, being admitted as due occupation. The object of compulsory occupation or the payment of an increased ground rent was to prevent large areas of country from falling into the hands of capitalists, to the exclusion therefrom of men of smaller means; but the penalty of additional charge for rent was easily evaded, seeing that the holders of limits had only to cut, or pretend to have cut, 357 pieces of square timber or 1,000 logs, to have a fifty mile limit maintained at fifty cents per mile rent, or reduced thereto had the rent been advanced.

After Confederation, compulsory occupation in Ontario was dispensed with, and the ground rent increased from fifty cents to $2 per square mile, and by the third clause of existing regulations it is made imperative that all new timber berths should be sold by public auction to the bidder of the highest amount of bonus per square mile; that berths should be offered for sale at such time and place as the Commissioner thought fit, instead of at any particular date or place; and that in the interim between sales no new licenses be granted, as under the regulations of 1866.

The duty of the Commissioner of Crown Lands with respect of disposing of timber berths, would seem clear and simple, inasmuch as he is by the auction system relieved from the necessity of acting on individual applications for licenses; but the fact is, that the management of public forests in Ontario is surrounded by many difficulties, not the least of which is the settlement of the country, which is extensively and rapidly taking place, in territory held under timber license, where lumbering operations are being carried on simultaneously with the location of the lands.

The management of timber on lands under license in unsurveyed territory, or in surveyed lands where settlement has not yet penetrated, is comparatively easy; all that is required being a close inspection of operations by wood rangers. But in old settled townships, where licenses granted many years past still obtain, and where settlers who had, prior to 1st July, 1867, purchased lots out of limits, being actual residents on their lots with certain improvements, are allowed to cut and sell the timber on their lands under the "settler's license regulations," the dues on the timber so sold being applied towards payment of the purchase money due the Crown, less ten per cent. for collection; and in newly surveyed townships in free grant territories covered by license, where locations have been or are being made under the Free Grants Act, as well as lands sold under the Land Act of 1860 within or adjoining timber limits, subject to the Pine Tree Regulations under Order-in-Council of 27th May, 1869, there is great care required in guarding against imposition and fraud upon the revenue, by passing timber cut on lands of the Crown in trespass as cut under authority of settler's license or general timber license, or in process of clearing the lands for cultivation under the 10th section of the Free Grants Act, and the Order-in-Council of 27th May, 1869, with respect to lands sold under the Land Act of 1860. To watch the interest of the revenue and at the same time avoid apparent harshness in dealing with settlers on the public lands demands the greatest circumspection by the department, and zeal and vigilance on the part of its employees on the ground; yet, notwithstanding the exercise of every care and precaution, the conflicting interests arising between lumber operators and settlers are frequent and perplexing.

The Free Grant Townships in the Muskoka, Parry Sound, and Nipissing Districts are being rapidly settled upon, the lands being in many cases selected and large improvements made before they were open for location or sale under the Act; in view of this fact, and that it would be impolitic to assume the attitude of retarding the settlement of the country, the question of dealing with the pine timber on the lands before they were formally located, so that the timber might be utilized in the public interest, instead of allowing it to be destroyed by fires, incidental to the clearing of the land, was somewhat embarrassing, seeing that the sawn lumber and square timber trade was in such a state of depression as had never before been experienced, and that in consequence the result of selling the townships situated as described, as timber berths, it was anticipated would be anything but satisfactory in a revenue point of view; however, as settlement could not be kept back, it became imperative that the right to cut the timber on the lands should be disposed of, so that as much as possible might accrue to the public chest. Accordingly, eight or nine townships, in the condition referred to were inspected as to the pine timber thereon, and reports examined with regard to the quantities in different parts of the townships, and berths of various areas from four to twenty-six square miles each were prepared so as to have the several groups of pine distributed over the respective berths and thereby as far as possible insure sales; through the careful management in the laying out of the berths, the sale, which took place was very successful, the amount realized giving an average of $200 per square mile.

In April, 1869, new regulations were introduced of which the following is a copy. They took the place of those established by Order-in-Council dated June 12, 1866, and published in the *Canada Gazette* of June 23, 1866, and enforced from that date:—

(3) Crown Timber Regulations.

(Established under Chapter 23 of the Consolidated Statutes of Canada by order of His Excellency the Lieutenant-Governor-in-Council, dated the 16th April, 1869).

1st. The Commissioner of Crown Lands may, at his discretion, cause the limit lines of any timber berths under license, which have not been already surveyed, to be properly surveyed and run, the costs of such survey to be paid by the holder of the license; and where two or more licenses are interested in the survey, the Commissioner shall determine what portion of the costs of the survey shall be paid by each, and such costs of survey shall be a charge upon the timber berth, to be paid with the ground-rent before renewal of the license.

2nd. The Commissioner of Crown Lands, before granting any licenses for new timber berths in the unsurveyed territory, shall, as far as practicable, cause the section of country where it is intended to allot such berths to be run out into townships, and each township, when so surveyed, shall constitute a timber berth, but the Commissioner of Crown Lands may cause such townships to be subdivided into as many timber berths as he may think proper.

3rd. The berths or limits, when so surveyed and set off, and all new berths or limits in surveyed territory, shall be explored and valued, and then offered for sale by public auction at the upset price fixed by such valuation, at such time and place, and on such conditions, and by such officer, as the Commissioner of Crown Lands shall direct by public notice for that purpose, and shall be sold to the highest bidder for cash at the time of sale.

4th. All forfeited timber berths may be offered for sale on the second Tuesday in August in each year by public auction, at such upset price, and at such place as the Commissioner of Crown Lands may fix and appoint by public notice, or at such other rate as he may fix by such notice, and shall be awarded to the highest bidder making payment at the time of sale, but should the said timber berth not be then sold, the same may be granted to any applicant willing to pay the said upset price and ground-rent or on such other terms as the Commissioner of Crown Lands may direct.

5th. License holders who shall have complied with all existing regulations shall be entitled to have their licenses renewed on application to the Commissioner of Crown Lands, or to such local agent as he may appoint for that purpose.

6th. The Commissioner of Crown Lands shall keep a register of all licenses granted or renewed, and of all transfers of such licenses; and a copy of such register with a plan of the licensed limits, shall be kept by the Crown timber agent of the locality, and open to public inspection.

7th. All transfers of timber berths shall be made in writing, but shall be subject to the approval of the Commissioner of Crown Lands, to whom they shall be transmitted for approval or rejection, and they shall be valid only from the time of such approval, to be expressed in writing.

8th. Timber berths are to be described in new licenses as "not to interfere with prior licenses existing or to be renewed in virtue of regulations." When the description of any berth or boundary, as given by any license, clashes with the description of any other licensed berth or territory, the license of more recent origin (tracing back only to the time when such license or any previous license, of which it is a renewal, was first granted) shall give way, and the Commissioner may amend or cancel such license wholly or in part, and substitute another in place thereof, so as to correct the description of the berth or limit intended to be licensed; and in all cases where any license has issued in error or mistake, or is found to be inconsistent with any other license, or inconsistent or incompatible with the regulations under which it was granted, the Commissioner of Crown Lands may cause it to be cancelled or amended, or he may refer all matters in dispute with reference to the boundaries and position of timber limits to arbitration, each of the contending parties to choose one arbitrator and the Commissioner of Crown Lands shall appoint an umpire, naming a day on or before which

the award of such arbitrators or of such umpire shall be made and delivered to the parties and such award shall be binding on them.

9th. Timber cut on limits for which license has been suspended or held in abeyance shall be considered as having been cut without authority, and treated accordingly.

10th. Occupants locatees, or purchasers of pubic lands, who have not completed all the conditions of sale or location, shall not, unless under settler's license, or for clearing, fencing, or building purposes on the said land, be permitted to cut timber or logs thereon, or to dispose of it to others. Persons found doing so shall be subject to the penalties established by law for cutting timber on the public lands without authority.

11th. All timber licenses are to expire on the 30th of April next after the date thereof, and all renewals are to be applied for and issued before the 1st of July following the expiration of the last preceding license, in default whereof the right to renewal shall cease, and the berth or berths shall be treated as forfeited.

12th. No renewal of any license shall be granted unless or until the ground-rent and all costs of survey, and all dues to the Crown on timber, saw-logs, or other lumber, cut under and by virtue of any license, other than the last preceding, shall have been first paid.

13th. All timber berths or limits shall be subject to an annual ground-rent of $3 per square mile, payable in advance, before the issuing of any original license or renewal.

14th. All timber, saw-logs, wood, or other lumber, cut under any license now in force, or under any license which may be hereafter granted, shall be subject to the payment of the following Crown dues, that is to say:—

Black walnut and oak, per cubic foot	$0 03
Elm, ash, tamarac and maple, per cubic foot	0 02
Birch, basswood, cedar, buttonwood and cottonwood, and all boom timber, per cubic foot	0 01¼
Red and white pine timber (per O.C. 27th April, 1887), per cubic foot	0 02
All other woods	0 01
Basswood, buttonwood and cottonwood, saw-logs, per standard of 200 feet board measure	0 15
Red and white pine saw-logs and boom timber, per standard of 200 feet B. M., (per O.C. 27th April, 1887)	0 20
Walnut, oak and maple saw-logs, per standard of 200 feet board measure	0 25
Hemlock, spruce, and other woods, per standard of 200 feet board measure	0 10
All unmeasured culled saw-logs, to be taken at the average of the lot, and to be charged for at the same rate.	
Staves, pipe, per mille	7 00
Staves, West India, per mille	2 25
Cordwood (hard) per cord	0 20
Cordwood (soft) per cord	0 12½
Hemlock tan-bark, per cord	0 30
Railway timber, knees, etc., to be charged 15 per cent. *ad valorem.*	

15th. The duties on timber shall be charged upon the quantity shown by the specification of measurement at the office of the supervisor of cullers, at Quebec, or that of the deputy-supervisor of cullers, at Sorel or Montreal, or by other reliable measurement, but where such actual measurement cannot be obtained, each stick of white pine timber shall be estimated as containing seventy

cubic feet, red pine as containing thirty-eight cubic feet, oak, fifty feet, and elm, forty-five feet, and all other wood as containing thirty-four cubic feet.

16th. All licensees, or occupants of timber berths, shall furnish, through themselves, their agents, cullers, and foremen, to such agent or agents as the Commissioner of Crown lands may appoint for that purpose, and at such time and place as such agent or agents may require, satisfactory proof upon oath as to the exact locality where all the timber, saw-logs, and other lumber in his or their possession were cut, giving the number of pieces and description of timber, saw-logs, and other lumber, cut by themselves and others to their knowledge upon each of the timber berths held or occupied by him or them, respectively, designating what quantity, if any, had been cut on settlers' lands, giving the names of such settlers, the name of the township, and the number of each lot and concession, exhibiting at the same time, for the inspection of such agent or agents, the books of count and measurement of such timber, saw-logs, and other lumber, under his or their control, respectively ; and shall moreover furnish such agent or agents all required information and facilities to enable him or them to arrive at a satisfactory determination as to the quantity and description of timber, saw-logs, and other lumber, made by him or them, or held in his or their possession, respectively, on which government dues are chargeable ; and in the event of such agent or agents deeming it expedient to cause such timber, saw-logs, and other lumber to be counted or measured, the said licensee, or occupier of such timber berth, and his or their agent, cullers and foremen, shall aid and assist in such count and measurement, but should such licensee or occupier, or his or their agents, fail to comply with these conditions, such licensee shall forfeit all right to a renewal of his license, and the berth and limit shall become vacant. And to enable persons who sell their timber under settler's license to obtain their refund of dues, and timber cut on patented lands, to pass duty free, it will be necessary for the parties interested to prove on oath, taken before such agent or agents, and to his or their satisfaction, the number of pieces and description of timber and saw-logs cut on each lot respectively. And in the event of such proof being deemed unsatisfactory, the said agent or agents may determine the same by causing a strict count of the stumps to be made, and then certifying according to such count.

17th. The Commissioner of Crown lands, or any authorized agent, shall at all times have free access to and be permitted to examine the books and memoranda kept by any licensee, showing the quantity of lumber in board measure, sawn by him from logs cut on his timber berth or berths, and failing to produce such books and memoranda when required so to do, will subject such licensee to a forfeiture of his right to a renewal of his license.

18th. When any license holder is in default for, or has evaded the payment of dues to the Crown on any part of his timber or saw-logs, such dues may be levied on any other timber or saw-logs belonging to such defaulter, cut under license, together with the dues thereon.

19th. Before moving any raft or parcel of timber, lumber, or saw-logs, from the agency in which it has been cut, the owner or person in charge thereof shall report the same to the Crown timber agent, making, if required, declaration upon oath, as to where the said timber was cut, the number of pieces and description of each kind of wood contained in such raft or parcel of timber, and the number of cribs, stating at the same time the number and description of pieces cut on private lands, also on lands under settler's license, giving the names of the owners or licensees of such land, with the names of the townships and number of each lot and concession ; and should such Crown timber agent not be satisfied with the correctness of such report, he shall cause a strict count to be made of the timber

in such raft; and on being satisfied of the correctness of such report of count, the Crown timber agent may grant a clearance, in due form, for such raft, stating the number of pieces and description of timber contained therein, distinguishing the timber cut on private lands and under settler's license from that cut on the Crown domain.

20th. The owner or holder of any such raft or parcel of timber shall, within twenty-four hours after the same shall have arrived at its destination at Quebec, Sorel, Montreal, or other port of sale or shipment, report the arrival of such raft to the collector of Crown timber dues, or if at Sorel or Montreal, to the deputy-supervisor of cullers; and should the said raft be found by the specification of measurement to contain a greater number of pieces of timber than is noted in the clearance, the surplus number of pieces, if not satisfactorily explained, shall be held as having been cut on Crown lands without authority, and subject to the payment of dues accordingly.

21st. Parties omitting to obtain their clearance at such agency, or omitting to report the arrival of such raft at its destination, as above mentioned, may be refused further license, and may be subject to forfeiture of the timber for evasion of regulations, as provided in Cap. 23, of the Consolidated Statutes of Canada

22nd. Persons evading or refusing the payment of timber dues, or the final settlement of bonds or promissory notes for the payment of such dues, or in default with the Crown timber office or agent; also persons taking forcible possession of disputed ground, before obtaining decision in their favor, and persons refusing to comply with the decision of arbitrators or of the umpire, as provided by the 8th section of these regulations, or with the regulations established by Order-in Council, or who forcibly interrupt surveyors in the discharge of their duty, shall be refused further licenses, and their berths shall be forfeited at the expiration of the then existing license.

23rd. Dues of all kinds on timber cut under license, remaining unpaid on the 30th November following the season in which it was cut, shall be subject to interest from that date, but without prejudice to the power of the Crown to enforce payment of such outstanding dues at any time the Commissioner of Crown Lands may think proper.

(4) On the Various Forms of Timber Licenses in Use.

There are four forms of timber license in use in the Province of Ontario; two for what is called the "Western Timber District," and the "Belleville District," one containing the right to cut timber on road allowances and the other not, and neither of them granting the right to cut rafting stuff on lands of the Crown. Two forms of licenses are used for the "Ottawa Agency," one having a stipulation concerning road allowances, and the other not, but both conferring the right to cut rafting stuff from the Crown lands.

The reason why the right to cut rafting stuff is confined to the Ottawa agency, is because, on the Ottawa timber and logs come from a long distance up the river, and from different tributary streams, and have to be rafted, broken up, and re-rafted in some cases several times before the timber and logs reach their destination; whereas on the rivers in other parts of the Province, no rafting takes place, the timber and logs being driven down the streams loosely till they reach the large waters of the lakes or the River St. Lawrence, on the shores of which rafting stuff can be cut or purchased.

The following copy of the simpler form of license used in the Western Timber District, will, with its notes, give an idea of these different licenses:

(5) Form of a Timber License in the Western Timber District.

By authority of Chapter 26 of the Revised Statutes of Ontario, and the Crown Timber regulations, dated the 16th day of April, 1869, and for and in consideration of the payments made and to be made to Her Majesty:

I do hereby give unto and unto agents or workmen, full power and license to cut every description of timber on lands or lots unlocated and unsold at the date of this License, or sold or located during the time this License is in force, and pine trees on lands or lots sold under Orders in Council of 27th May, 1869, or sold or located under the Free Grants and Homesteads Act of 1868 or amendment of the said Act, by Chapter four of the Statutes of Ontario of 1880, and pine and cedar trees, when reserved, on lots sold under Order in Council of 3rd April, 1880, prior to the date of this license, and pine trees on lots patented under said Chapter four, or patented as mining lands, under the General Mining Act, or patented or leased under Statute 54 Victoria. Chapter eight, upon the location described on the back hereof by and to hold and occupy the said location to the exclusion of all others, except as hereinafter mentioned from to thirtieth of April, 18 , and no longer; with the right of conveying away the said timber through any ungranted, uncleared, or waste lands of the Crown:—

And by virtue of this license, the said licensee ha right by the said statute to all timber cut by others during the term of this license in trespass on the ground hereby assigned, with full power to seize and recover the same.

But this license is subject to the following conditions, viz.:—

To the withdrawal therefrom of lots located or sold under the Free Grants and Homesteads Act of 1868, prior to the passing of Chapter four of the Statutes of Ontario of 1880, and for which patent may be granted on the ground that five years had elapsed from the date of such location or sale, and that the conditions of settlement had been complied with prior to thirtieth April preceding the date or issue of the license.

That any person or persons may at all times make and use roads upon, and travel over the ground hereby licensed.

That nothing herein shall prevent any person or persons from taking from the ground covered by this license, standing timber of any kind (without compensation therefor) to be used for the making of roads or bridges or public works, by or on behalf of the Province of Ontario, the authority of the Department of Crown Lands having first been obtained.

That persons settling under lawful authority or title within the location hereby licensed, shall not in any way be interrupted in clearing and cultivation by the said licensee , or any one acting for or by permission.

That the Commissioner of Crown Lands, under Order in Council of 27th April, 1885, may at any time during the currency of this license, cancel the right to cut timber other than pine upon any lots, included in the description in this license, which may have been sold or located subsequent to the date hereof, or upon any lots in said description which may have been squatted upon with the *bona fide* intention of location or purchase.

And further: under condition that the said license or representatives shall comply with all regulations that are or may be established by Order in Council, and shall submit all the timber, saw logs or other lumber cut under this License to be counted or measured, and settle for the duties chargeable thereon, when required by me or any officer thereunto authorized,—otherwise the

said timber will be forfeited to the Crown, and the said licensee be subject to such other penalties as the Act provides.

Given under my hand, at Toronto, the day of in the year of our Lord, one thousand eight hundred and ninety- in duplicate.

Commissioner.

The stipulation in regard to road allowances found in two of the forms, is as follows :—

And every government road allowance or parts thereof, embraced within the boundaries of the tracts or parcels of land above mentioned or described, and all such portions of any government road allowance as border upon any tract, lot, or parcel of land above mentioned or described, and lie between the side-lines or between the front and rear-lines, or between a side-line and a front or rear-line, or between different parts of any line of said tracts, lots, or parcels of land produced across such road allowance; provided, however, that when any portion of a road allowance is found to be included in any two licenses covering lands on opposite sides of such road allowance, then each license is to extend only to the centre line of such road allowance; and provided also, that all disputes arising out of any conflict of licenses covering government road allowances shall be decided by the Commissioner of Crown Lands, who may define what portion of any road allowance is included in each license, and his decision shall be binding.

This license not to interfere with prior licenses.

(6) System of Wood Ranging.—Efforts to Prevent Waste.

The Commissioner of Crown Lands, in the communication already cited describes the operation of these regulations and the system of wood-ranging was then introduced. This is admitted as at first crude and experimental, but it has since gone on with modifications as suggested by experience, until it is deemed at present as perfect as can practically be carried out.

A staff of from twenty to thirty experienced and reliable rangers are employed each season, some of them being engaged from December till the 30th of April, and a few of the supervising rangers up to the end of October. The result has been satisfactory in the highest degree, the revenue having increased in the several agencies immediately after the inception of the system to the extent of from fifty per cent, and in one agency even 400 per cent.

Instead of agents dealing with accounts for timber dues as formerly, all returns, together with ranger's reports, are transmitted to the department, where the timber limit operations and cutting on special lots of land are checked, and all accounts made up, and transmitted to agents for the collection of the dues and transmission of the same to headquarters as collected.

Wood-rangers have standing instructions to report generally on any wanton or special waste, when such has been observed in connection with lumbering operations, and in cases of licensees allowing standing pine through which fire has passed to become lost instead of utilizing it before it is destroyed by what is termed the "boring worm." A few cases of waste transpired some years ago by licensees arranging with jobbers to cut saw-logs on their timber limits, the logs, by agreement, to be up to a certain standard of quality—all logs falling short of the standard fixed being rejected and left in the woods—and an attempt made to leave the rejected timber out of the returns; but through the vigilance of the wood-rangers of the department, such transactions were nipped in the bud, and abandoned when parties found that they had to account for and make payment to the Crown on every tree cut down. The only real waste of timber in lumber-

ing is in connection with the manufacture of square pine and board, (or octagonal) pine timber, especially the former, in squaring which and in the rejection of the upper portion of the tree where the limbs begin, fully one-third of the tree is wasted, viz., one-sixth of the best of the timber in siding off to reach the square, and one-sixth of the upper part of the tree which is left in the woods, but which if drawn, would be valuable at a saw-mill, where it could be cut into various qualities of lumber, either fit for domestic use or export. The waste referred to has been noticed by this department for years past, but under the regulations past and present and the tenure under which licenses to cut timber are held, and have been held for many years, it is found difficult to uproot a system which has obtained so long, and in which there are so many vested interests and so much capital involved.

Production of Timber in Canada, 1890.

The following table taken from the Statistical Year Book of Canada (1891), p. 14, gives the production of timber in the whole of Canada during the year 1890 :

Timber.	Ontario.	Quebec.	New Brunswick.	British Columbia.	Nova Scotia.	Manitoba and N.W.T.
Saw logs – B.M.	522,524,283	495,449,000	108,569,122	79,177,055	**78,603,742	30,605,906
Square timber, c. ft.	3,392,629	2,151,791	16,818	.....	.....	.....
Boom " pieces	150,361	5,240	7,375	.....	.....	.....
Hardwood, c. ft.	12,527	67,428	†	.....	.....	.....
Railway ties, No.	672,410	139,550	79,488	.....	.....	.....
Cordwood, cords	29,971	8,747	1,356	.....	.....	.....
Telegraph poles	468	635	3,163	.....	.....	.....
Cedar, lin. ft.	162,346	.....	4,716,201	.....	.....	.....
Cedar posts, tanbark and bolts, cords	4,147	10,769	258	.....	.....	.....
Pile timber, B. M.	11,664	.....	.....	.....	.....	.....
Shingles, M.	.....	3,331	615	.....	.....	.....
Battens, knees, etc., No.	.....	1,230	14,787	.....	.....	1,449,916
Posts and rails, No.	* 1,225	.....	6,820	.....	.....	§ 156,402
Staves, poles, etc., M.	.....	.....	‡ 63	.....	.....	.....
Dues received, $	878,772	806,052	112,475	29,678	.....	102,951

* Traverses. * *Trans-Atlantic shipments only. † Included in square timber. ‡ Rafting pins. || Pulp and bobbin wood included. § Laths.

The Ontario Fire Act.

The following Act (Cap. 213, R.S.O.) was passed by the Legislature of Ontario in 1878, with the view of preventing the occurrence of the fires which have wrought so much devastation among the forests of the Province :—

An Act to preserve the Forests from destruction by Fire.

Preamble.

WHEREAS large quantities of valuable timber are annually destroyed by fires which are in many instances the result of negligence and carelessness, it is therefore necessary to provide stringent regulations for the prevention of such fires.

Therefore Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

Lt.-Governor may proclaim a fire district.

1. The Lieutenant-Governor may, by proclamation to be made by him from time to time, issued by and with the advice and consent of the Executive Council, declare any portion or part of the Province of Ontario to be a fire district.

Publication of fire district.

2. Every proclamation under this Act shall be published in the *Ontario Gazette*, and such portion or part of the Province as is mentioned and declared to be a fire district in and by the said proclamation, shall, from and after the said publication, become a fire district within the meaning and for the purposes of this Act.

Revocation.

3. Every such portion or part of the Province mentioned in such proclamation shall cease to be a fire district upon the revocation by the Lieutenant-Governor in Council of the proclamation by which it was created.

Fires not to be started except for certain purposes and in certain periods.

4. It shall not be lawful for any person to set out, or cause to be set out or started, any fire in or near the woods within any fire district, between the first day of April and the first day of November in any year, except for the purpose of clearing land, cooking, obtaining warmth, or for some industrial purpose; and in cases of starting fires for any of the above purposes, the obligations and precautions imposed by the following sections shall be observed.

Precautions to be taken in case of clearing land.

5. Every person who shall, between the first day of April and the first day of November, make or start a fire within such fire district for the purpose of clearing land shall exercise and observe every reasonable care and precaution in the making and starting of such fire, and in the managing of and caring for the same after it has been made and started, in order to prevent such fire from spreading or burning up the timber and forests surrounding the place where it has been so made and started.

Precautions in case of cooking, etc.

6. Every person who shall, between the first day of April and the first day of November make or start within such fire district a fire in the forest, or at a distance of less than half-a-mile therefrom, or upon any island for cooking, obtaining warmth, or for any industrial purpose, shall—

1. Select a locality in the neighbourhood in which there is the smallest quantity of vegetable matter, dead wood, branches, brushwood, dry leaves, or resinous trees;

2. Clear the place in which he is about to light the fire by removing all vegetable matter, dead trees, branches, brushwood and dry leaves from the soil within a radius of ten feet from the fire;

3. Exercise and observe every reasonable care and precaution to prevent such fire from spreading, and carefully extinguish the same before quitting the place.

Precautions in case of matches, burning substances, etc.

7. Any person who shall throw or drop any burning match, ashes of a pipe, lighted cigar, or any other burning substance, or who shall discharge any fire-arm within such fire district shall be subject to the pains and penalties imposed by this Act, if he neglect completely to extinguish before leaving the spot the fire of such match, ashes of a pipe, cigar, wadding of the fire-arm, or other burning substance.

Act to be read to employees by heads of surveys, lumberers, etc.

8. Every person in charge of any drive of timber, survey or exploring party, or of any other party requiring camp-fires for cooking or other purposes within such fire district, shall provide himself with a copy of this Act, and shall call his men together and cause said Act to be read in their hearing, and explained to them at least once in each week during the continuance of such work or service.

Precautions as to locomotives.

9. All locomotive engines used on any railway which passes through any such fire district or any part of it, shall, by the company using the same, be provided with and have in use all the most approved and efficient means used to prevent the escape of fire from the furnace or ash-pan of such engines, and that the smoke stack of each locomotive engine so used shall be provided with a bonnet or screen of iron or steel wire netting, the size of the wire used in making the netting to be not less than number nineteen of the Birmingham wire gauge, or three sixty-fourths parts of an inch in diameter, and shall contain in each inch square at least eleven wires each way at right angles to each other, that is in all twenty-two wires to the inch square.

Duty of engine drivers.

10. It shall be the duty of every engine driver in charge of a locomotive engine passing over any such railway within the limits of any such fire district, to see that all such appliances as are above-mentioned are properly used and applied, so as to prevent the unnecessary escape of fire from any such engine as far as it is reasonably possible to do so.

Penalty for non compliance with this Act.

11 Whosoever unlawfully neglects or refuses to comply with the requirements of this Act in any manner whatsoever, shall be liable upon a conviction before any justice of the

peace to a penalty not exceeding fifty dollars over and above the costs of prosecution, and in default of payment of such fine and costs, the offender shall be imprisoned in the common gaol for a period not exceeding three calendar months; and any railway company permitting any locomotive engine to be run in violation of the provisions of the ninth section of this Act shall be liable to a penalty of one hundred dollars for each offence, to be recovered with costs in any court of competent jurisdiction.

Time for bringing action.

12. Every suit for any contravention of this Act shall be commenced within three calendar months immediately following such contravention.

Disposal of fines.

13. All fines and penalties imposed and collected under this Act shall be paid one-half to the complainant or prosecutor and the other half to Her Majesty for the public use of the Province.

Government agents to enforce this Act.

14. It shall be the special duty of every Crown Land agent, Woods and Forests agent, Free Grant agent, and bush ranger, to enforce the provisions and requirements of this Act, and in all cases coming within the knowledge of any such agent or bush ranger to prosecute every person guilty of a breach of any of the provisions and requirements of the same.

Act not to interfere with right of action for damages occasioned by fire.

15. Nothing in this Act contained shall be held to limit or interfere with the right of any party to bring and maintain a civil action for damages occasioned by fire, and such right shall remain and exist as though this Act had not been passed.

DESCRIPTION OF "FIRE DISTRICTS" UNDER CAP. 213 OF THE STATUTES OF ONTARIO.

District No. 1.—Commencing at a point on the north shore of Lake Huron where Provincial Land Surveyor Albert P. Salter's meridian line between ranges numbers twenty-one and twenty-two west intersects the water's edge, said point being the south-west angle of the Township of Plummer; thence easterly, following the turnings and windings of the shore along the water's edge of Lake Huron and the Georgian Bay to the mouth of French River; thence south-easterly, along the easterly shore of the Georgian Bay, and taking in Parry Island, to the north-west angle of the Township of Matchedash; thence south-easterly along the westerly boundaries of the Townships of Matchedash and North Orillia to the south-west angle of North Orillia; thence north-easterly along the southerly boundary of North Orillia to the waters of Lake Couchiching; thence easterly across said lake to the south-west angle of the Township of Rama; thence easterly along the south boundaries of the Townships of Rama, Dalton, Digby and Lutterworth to the north-west angle of the Township of Galway; thence southerly along the westerly boundaries of the Townships of Galway and Harvey to the south-west angle of Harvey; thence easterly along the south boundaries of the Townships of Harvey, Burleigh, Methuen, Lake and Tudor, to the north west angle of the Township of Elzevir; thence southerly along the west boundary of

Elzevir to the south-west angle of said township ; thence easterly along the south boundaries of the Townships of Elzevir, Kaladar, Kennebec, Olden, Oso and South Sherbrooke, to the south-east angle of the Township of South Sherbrooke ; thence north-westerly along the easterly boundaries of the Townships of South and North Sherbrooke to the southerly boundary of the Township of Lavant ; thence north-easterly along the southerly boundaries of the Townships of Lavant and Darling, to the south-easterly angle of the Township of Darling ; thence north-westerly along the easterly boundaries of the Townships of Darling and Bagot, to the north-easterly angle of the Township of Bagot ; thence south-westerly along the northerly boundaries of the Townships of Bagot and Blithefield, to the easterly boundary of the Township of Brougham ; thence north-westerly along the easterly boundaries of the Townships of Brougham, Grattan, Wilberforce and Alice, to the waters of the Upper Allumette Lake ; thence north-westerly, following the water's edge of said lake and the Ottawa River to the head of Lake Temiscamingue ; thence due north along the boundary between the Provinces of Ontario and Quebec, to the northern boundary of the Province of Ontario ; thence westerly along the said northern boundary to its intersection with the production northerly of Provincial Land Surveyor Albert P. Salter's meridian line between the said ranges numbers twenty-one and twenty-two west, and thence southerly along said meridian line produced to the place of beginning.

District No. 2.—All that part of the said Province lying west of Provincial Land Surveyor Albert P. Salter's meridian line between ranges twenty-one and twenty-two west, near Bruce Mines, in the District of Algoma, and west of the said meridian line produced to the northern boundary of the Province, the said meridian line being the western boundary of the Fire District established by the Proclamation of March 27th, 1878.

The Ontario Fire-Ranging System.

In 1888 the Department of Crown Lands (Ontario), inaugurated a system of fire ranging, explained in the circular-letter to limit-holders given below, the cost of which is borne in equal parts by the Province and the lumbermen. It is very generally adopted by limit-owners and is believed to have been instrumental in greatly reducing the annual loss through forest fires :—

Sir.—The Commissioner of Crown Lands, feeling the importance of creating some better organization for preventing the destruction of the forest by fire, has approved of a scheme, the principal points of which are herein stated to you, so that you may, should the position of your limits make it desirable, avail yourself of its advantages.

It is proposed that during the dangerous period, say from the first day of May to the first day of October in each year, there shall be placed on such limits as are exposed to danger a man or men who will be empowered and instructed to use every endeavor to prevent and suppress fires in every way possible, and the ranger who is placed in charge of a limit will be authorized to engage whatever help may be necessary to cope with a dangerous fire where prompt action is necessary ; these men will be supplied copies of the "Fire Act," and instructed to post them up in public and conspicuous places, to visit each person resident on the limit and give them, if thought advisable, a copy of the Act, explaining to them its provisions, penalty for its infraction, etc., and to endeavor to enlist their assistance and sympathy to make the Act effective.

The department will leave the limit holder to suggest the number of men who should be placed on his limit, and as it is of all things necessary that prac-

tical bushmen of good judgment and well acquainted with the limit should be selected, he, the limit holder, will nominate the man to be placed in charge of the limit and his subordinates, if any, the department reserving the right to limit the number of men to be employed on any limit and also to reject or remove any man whom it finds unfitted to discharge the duties of the position.

It is hoped that limit holders will recognize the necessity of recommending men of good judgement and cool temper who, while fully discharging their duties, will not harass or annoy settlers or others, as, if an animus is created in the breasts of the settlers the scheme will undoubtedly fail to effect the result expected. Limit holders will be expected to exercise supervision over these men and see that they thoroughly and effectually perform their duties.

With respect to remuneration the department thinks that the man in charge of a limit should be paid dollars a day, which should cover board and ordinary expenses, and where subordinates are required, that suitable men can be obtained at dollars per day, which should also cover board and ordinary expenses; the men will be appointed bush and fire rangers and instructed from here so as to clothe them with authority under section 14 of the Fire Act, and a copy of the instructions will be furnished each limit holder.

As the limit holder is reaping a large proportion of the benefit, it is intended that he should bear one-half of the cost of men and expenses which may be incurred under this scheme.

The department will pay wages and expenses and charge to each limit holder his proportion, which will be a charge upon the limit and an account will be rendered at the close of the season, when prompt payment must be made.

Should you desire to avail yourself of this scheme you will at once address a letter to the department to that effect, stating the limits you wish protected, the number of your license for current season, the number of men you would recommend to be employed, and submit a list of those you would recommend for appointment on your limits.

AUBREY WHITE,
Assistant Commissioner.

Department of Crown Lands,
(Woods and Forest Branch,)
April, 1888.

AN ACT RESPECTING THE ROCKY MOUNTAINS PARK OF CANADA.

Chap. 32 of 50-51 Vict. setting apart a national park at Banff in the Rocky Mountains reads thus :—

Whereas it is expedient in the public interest that a national park and sanatorium should be set apart and established in the North-west Territories; Therefore, Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows :—

1. The tract of land comprised within the limits hereinafter set forth, that is to say, commencing at the easterly end of Castle Mountain station grounds, on the Canadian Pacific Railway, as shown on a plan of right-of-way filed in the Department of Railways and Canals by the Canadian Pacific Railway Company, thence on a course about south thirty-five degrees east, ten miles, more or less, to a point in latitude seven minutes, six seconds and ninety-six hundredths of a second south of the point of commencement, and in longitude seven minutes, fifty-four seconds and ninety-eight hundredths of a second east of the point of commencement; thence on a course about north fifty-five degrees east, twenty-six miles, more or less, to a point in latitude five minutes, forty-six seconds and twenty hundredths of a second north of the point of commencement, and in longitude thirty-seven minutes, twenty-three seconds and thirty-one hundredths of a second east of the point of commencement; thence on a course about north thirty-five degrees west, ten miles, more or less, to a point in latitude twelve minutes, fifty-three seconds and ninety-one hundredths of a second north of the point of commencement, and in longitude twenty-nine minutes, thirty-two seconds and thirty-eight hundredths of a second east of the point of commmencement; thence on a course about south fifty-five degrees west, twenty-six miles, more or less, to the place of commencement, containing by admeasurement two hundred and sixty square miles, be the same more or less, so far as the title to the said tract of land in whole or in part, is now vested in the Crown, is hereby withdrawn from sale, settlement and occupancy under the provisions of "The Dominion Lands Act" or any regulations made under the said Act or any other Act with respect to mining or timber licenses or any other matter whatsoever.

2. The said tract of land is hereby reserved and set apart as a public park and pleasure ground for the benefit, advantage and enjoyment of the people of Canada, subject to the provisions of this Act and of the regulations hereinafter mentioned, and shall be known as the Rocky Mountains Park of Canada.

3. No person shall, except as hereinafter provided, locate, settle upon, use or occupy any portion of the said public park.

4. The park shall be under the control and management of the Minister of the Interior, and the Governor-in-council may make regulations for the following purposes :—

(*a*) The care, preservation and management of the park and of the water-courses, lake, trees and shrubbery, minerals, natural curiosities and other matters therein contained.

(*b*) The control of the hot springs situate in the said park, and their management and utilization for purposes of bathing and sanitation and in every other respect.

(*c*) The lease for any term of years of such parcels of land in the park as he deems advisable in the public interest, for the construction of buildings for ordinary habitation and purposes of trade and industry, and for the accommodation of persons resorting to the park.

(*d*) The working of mines and the development of mining interests within the limits of the park, and the issuing of licenses or permits of occupation for the said purposes; but no lease, license or permit shall be made, granted or issued under this or the next preceding paragraph of this section which will in any way impair the usefulness of the park for the purposes of public enjoyment and recreation.

(*e*) Trade and traffic of every description.

(*f*) The preservation and protection of game and fish, of wild birds generally, and of cattle allowed to pasture in the park.

(*g*) The issuing of licenses or permits for the pasturage of cattle, and the management of hay lands.

(*h*) The removal and exclusion of trespassers.

(*i*) And generally for all purposes necessary to carry this Act into effect according to the true intent and meaning thereof.

(2) The Governor-in-council may, by the said regulations, impose penalties for any violation thereof, not exceeding in each case the sum of fifty dollars, or, in default of payment with costs, imprisonment for not more than three months.

5. Every regulation made as aforesaid, shall, after publication for four consecutive weeks in the *Canada Gazette*, and in any other manner that may be provided thereby by the Governor-in-council, have the like force and effect as if it was herein enacted, and such regulations shall be laid before Parliament within fifteen days after its first meeting thereafter.

6. Nothing in this Act contained shall affect the obligations of the Government (if any) arising out of the conditions of the acquisition of the North-west Territories.

7. This Act may be cited as "Rocky Mountains Park Act, 1887."

Regulations Respecting Rocky Mountains Park.

By Order-in-Council of Monday, 30th June, 1890, under authority of "The Rocky Mountains Park Act," 50-51 Vict., chap 32, s. 4, the Order-in-Council of the 27th day of November, 1889, establishing regulations for the control and management of the Rocky Mountains Park of Canada was cancelled, and the following Regulations, approved in point of form by the Minister of Justice, were substituted after the 1st day of July, 1890, for the regulations established by the said Order-in-Council.

(1) No person shall, without permission from the Minister of the Interior, reside permanently within other portions of the park than those sold or leased.

(2) The superintendent of the park (hereinafter called the superintendent) may issue permits to visitors for camping upon such ground as he may designate; any one camping without such permit shall be considered a trespasser, and the fee for such permit shall be one dollar per month per tent; provided, however, that no such permit shall be granted for camping in any portion of the park situated south of Bow River.

(3) The defacement of any object at any of the hot springs, or of any of the natural rock formations, or timber, by written inscription, or otherwise, is strictly forbidden; as is also the throwing of any stones, sticks or other substances whatsoever into any of the springs or streams in the Park.

(4) No advertisements, other than those issued or permitted by the Minister of the Interior, shall be posted or displayed within the park, except on leased property in the town site of Banff, or property in the village of Anthracite.

(5) No live stock shall be permitted to run at large, nor shall pigs, sheep or goats be brought into or kept within the park, provided, however, that licensed butchers may bring in and keep for a period not exceeding thirty days, and at such places and in the manner to be prescribed by the superintendent, animals to be slaughtered for food purposes.

(6) The superintendent shall from time to time select and designate pasturing grounds within the park, upon which leaseholders may pasture not in excess of two milch cows and two horses for each lot leased; but leaseholders availing themselves of this regulation shall make provision satisfactory to the superintendent for herding the animals and driving them to and from the pasture grounds.

(7) All stock found pasturing, except where authorized, may be impounded and held until a proper guarantee be given that the trespass will not be repeated, and until a fine be paid sufficient to cover the expenses of impounding such stock, feeding them while so impounded, and advertising. Failure to give the necessary guarantees and to pay the fine within thirty days shall render the stock liable to be sold by the superintendent, and the proceeds of such sale, after paying thereout the fine, cost of maintenance, advertising and sale, shall be paid by the superintendent to the owner of the stock. The superintendent may authorize any person to act as pound-keeper, the rates of remuneration to be settled by the Minister of the Interior.

(8) The superintendent shall, upon application, furnish each owner of a dog or bitch, upon payment of a fee of one dollar in the case of a dog and two dollars in the case of a bitch, with a license authorizing him to keep such dog or bitch; such licenses shall expire on the thirtieth day of June in each year, and shall then be renewed; and any unlicensed dog or bitch may be impounded or destroyed, at the discretion of the superintendent.

(9) No person shall cut or remove any timber, growing or dead, or remove or displace any mineral deposits or natural curiosities, unless by written permission of the superintendent.

(10) No rubbish or any matter of an offensive nature shall be deposited, except in such places and at such times and under such conditions as the superintendent shall designate.

(11) No person shall ride or drive on or over any bridge within the park faster than a walk; furious riding or driving on public roads is also prohibited.

(*a*) Horses driven with sleighs shall be provided with bells.

(*b*) No person shall ride or drive across or on any side-walk, boulevard, vacant lot, or common within the park, without the written permission of the superintendent. Horse-racing is also prohibited, except in such places as may be set apart for the purpose by the superintendent

(*c*) Horses in use or attached to any vehicle shall not be allowed to stand without being tied or in charge of some grown person.

(12) The waters of the hot springs shall be controlled by the superintendent, and shall be supplied to licensed bath-houses at such rental per annum as may be fixed from time to time by Order-in-Council, and the superintendent may at any time shut off the supply of the said water, after two weeks' notice in writing, from any such bath-house, the lessee of which may be in arrears for rent or who

may have in any way infringed any of the provisions of this or the next succeeding clause; and no person shall in any way interfere or tamper with any spring, pipes, valves, traps, tanks, or any other apparatus connected with the supply and distribution of the said water.

(13) The superintendent or his authorized agent shall have free access for inspection at all reasonable times to any bath-house or building using the water of the springs, or to any pipe leading to or within such bath-house or building.

(14) The Minister of the Interior shall have power to cause such portion of the park as from time to time he may designate to be surveyed and laid out in building lots, for the construction thereon of buildings for ordinary habitation and purposes of trade and industry, and for the accommodation of persons resorting to the park, and may issue leases for such lots for any term not exceeding forty-two years, with the right of renewal, at rentals to be from time to time fixed by him; also, to set apart such portions of the park as he may think proper for the sites of market-places, jails, court-houses, places of public worship, burying-grounds, benevolent institutions, squares, and for other similar public purposes.

(15) The location, design, and general character of any buildings to be erected as dwelling-houses or for purposes connected therewith, or fences, shall be subject to the approval of the superintendent and to the sanction of the Minister of the Interior.

(*a*) No timber on any lot leased for residential purposes, except so much as is actually necessary to be removed to make room for the building and reasonable access thereto, shall be cut or removed, except by permission of the superintendent.

(16) The Minister of the Interior may issue licenses of occupation for the working of mines and the development of mineral interests within the limits of the park, subject, however, to the approval in each instance by the Governor-in-Council, of the terms, conditions, and duration of such licenses of occupation.

(17) All leases or licenses of occupation shall be in such form as may be approved by the Minister of the Interior and the Minister of Justice.

(18) No bar-room or saloon shall be permitted within the park.

(19) The following restrictions on the sale of intoxicating liquors in the park shall be imposed and enforced, in addition to the restrictions imposed by the North-west Territories Act. The sale of intoxicating liquors even under the special permission granted under section ninety-two of the said Act, is strictly prohibited, except in hotels, and there it shall only be allowed to hotel guests for table use. Nor shall any person after obtaining such special permission, sell, exchange, trade or barter, or have in his possession within the park, even for hotel use under this regulation, any intoxicating liquor, until his special permission issued in accordance with section ninety-two of the said North-west Territories Act has been countersigned by the Minister of the Interior or his deputy, for which countersigning a fee of fifty dollars shall be charged in each case; and no permit for a hotel shall be so countersigned unless such hotel shall have at least twenty bed-rooms of a size and to be furnished in a manner satisfactory to the superintendent.

(20) If at any time during the continuance of the permit the superintendent reports that the accommodation hereinbefore specified is not maintained, or if it is proved to the satisfaction of the Minister of the Interior that the hotel is not being conducted in an orderly and proper manner, the permit may be revoked and cancelled by the Minister of the Interior and the permittee shall have no claim to have repaid to him any portion of the fee paid for countersigning such permit.

(21) No person shall do business as a peddler in the park or act as guide therein without a license from the Minister of the Interior, who shall have power

to revoke such license in his discretion; and no guide shall be entitled to charge for his services more than fifty cents per hour for six hours or under, and not more than three dollars for any day not exceeding ten hours.

(22) All slaughter-houses, butcher-shops, fish-stalls, and any other business which from its nature is or may become offensive or obnoxious, shall be carried on only at such places as the superintendent may designate in the license for the establishment of such business, and shall be subject at any time, on sixty days' notice in writing delivered to the owner or lessee in person, or left at his place of residence or place of business to removal to such other place as the superintendent may designate. Every license issued under this clause shall be subject to revocation at any time upon thirty days' notice to the licensee, and the business shall entirely cease on the revocation of a license.

(23) The Minister of the Interior may issue a license to any person or persons undertaking to place a steam yacht or other vessel, or vesssels, suitable for the conveyance of passengers, and in all respects complying with the Steamboat Inspection Act or Acts regulating steam and other vessels, on any waters within the park, to date from the first day of April in each year. The maximum fare which may be charged for the conveyance of passengers in such boats shall not exceed when running on regular trips up to eight miles, fifty cents; above eight and up to twelve miles, seventy-five cents; over twelve miles, one dollar.

(24) Licenses to carry on livery stables may be issued by the Minister of the Interior, the fee for which shall be ten dollars per annum for each vehicle drawn by two or more horses, and six dollars for each vehicle drawn by one horse; and no person shall keep horses or conveyances for hire without first having obtained such license. The rates which may be charged for the hire of carriages or other vehicles, and saddle horses, shall not exceed the following:—

(*a*) For the conveyance of one passenger from or to the railway station to or from any licensed hotel or boarding-house within a radius of one-and-a-half miles of the station, fifty cents; to all points beyond one-and-a-half and within three miles of the railway station, one dollar.

(*b*) For the conveyance of one passenger when there are at least four passengers in the vehicle, from any one point within one mile of the Bow River bridge, at the end of Banff avenue, to and from Devil's Lake, two dollars.

(*c*) For conveyance in any vehicle, drawn by two horses, and carrying not more than four persons, for one passenger, one dollar for the first hour, and twenty-five cents an hour for each additional passenger for the first hour; and for every subsequent hour, fifty cents for one passenger and twenty-five cents for each additional passenger.

(*d*) For conveyance in any vehicle drawn by two or more horses and carrying more than four persons, seventy-five cents an hour for each person for the first hour, and twenty-five cents an hour for every subsequent hour.

(*e*) For conveyance in any vehicle drawn by one horse, one dollar an hour for one person for the first hour, fifty cents an hour for an additional person for the first hour, and fifty cents for each person for every subsequent hour.

(*f*) For saddle-horses, three dollars for a whole day, two dollars for a half day or by the hour seventy-five cents for the first hour and fifty cents for each subsequent hour. In calculating half-a-day, one o'clock, p.m., shall be the hour of division; the maximum time allowed for a half day shall be five hours; and twenty-five cents may be charged for each subsequent hour.

(*g*) The rates for cartage of freight or general merchandise shall be subject to agreement between the parties interested.

(25) The tires on waggons used for freighting purposes on the roads constructed by the government within the park shall be at least two inches and

a-half in width; all vehicles shall be provided with brakes; and it shall be the duty of the superintendent to condemn and prohibit the use of any vehicle which in his opinion is unsafe.

(26) All drivers of public vehicles shall be licensed; the fee therefor shall be one dollar; and such license may be revoked and cancelled at any time by the superintendent if it is proved to his satisfaction that the holder thereof has been guilty of incivility, insobriety, or misconduct, while discharging his duties.

(27) No person shall keep a pool, billiard, or bagatelle-table, or bowling-alley for use by the public, without a license; such license shall be for one year from the first day of May in each year, and the fees for such license shall be the following:—

(*a*) For one billard or pool-table, twenty dollars and for each additional table ten dollars.

(*b*) For one bagatelle, Mississippi, pigeon-hole or other table or board with balls, twenty dollars and for every additional table ten dollars.

(*c*) For a bowling-alley, ten dollars.

(28) Every description of gaming and all playing of faro, cards, dice, or other games of chance for stakes of money or other things of value, and all betting and wagering on any such games of chance, are strictly forbidden and prohibited within the park, and no person shall play at or allow to be played on his premises, or assist, or be engaged in any way in any description of gaming, as aforesaid.

(29) The shooting at, wounding, capturing, killing, or in any manner injuring any wild animal or bird within the park, is hereby prohibited, excepting, however, mountain lions, bears, wolves, lynxes, wolverines, coyotes, wild cats and hawks. Fishing with nets in any of the waters of the park is also prohibited.

(30) The outfits of all persons found hunting, or fishing with nets, or having in their possession game or fish killed within the park in contravention of clause 29 of these regulations shall be subject to seizure and confiscation.

(31) Permission to cut hay within the park shall be obtained from the superintendent and shall be subject at all times to his supervision and control.

(32) No person shall take or use any stone, sand, gravel, or other material in the park without a permit from the superintendent, and the the following fees shall be paid to the superintendent for such materials:—

Sand	10 cents, per load.
Stone	25 " "
Gravel	25 " "

(33) Persons desiring to burn lime or manufacture brick within the park shall obtain a permit from the superintendent, defining the location of the kiln or brick yard, and pay a royalty of one cent and a half per bushel for all lime burnt, and, for all brick manufactured, a rate per thousand to be fixed by the Minister of the Interior.

(34) The use of fire-arms within the park, except under permit from the superintendent, is strictly prohibited.

(35) If any offence is committed under any of the provisions of these regulations, such offence shall be prosecuted, under the "Summary Convictions Act," before the superintendent of the park, who for the purposes hereof shall be, *ex-officio*, a justice of the peace, with jurisdiction anywhere within the park or before any officer of the North-west mounted police force empowered by law to sit and act as a justice of the peace.

(36) Except as hereinafter specially provided, every one who violates any provision of any of these regulations, shall be liable to a penalty not exceeding

twenty dollars and costs, and in default of payment to imprisonment for a term not exceeding one month.

(37) Every one who violates any of the provisions of clause number nineteen of these regulations, which relates to the sale of intoxicating liquors within the park shall be liable to a penalty not exceeding in each case the sum of fifty dollars and costs, and in default of payment thereof to imprisonment for a term not exceeding three months; and a moiety of every penalty imposed and collected under the provisions of this clause of these regulations shall belong to Her Majesty and the other moiety to the person laying the information.

(38) Every one who violates any of the provisions of clause twenty-eight of these regulations, which relates to gaming, shall be liable to a penalty not exceeding in each case the sum of fifty dollars and costs, and in default of payment thereof to a term of imprisonment not exceeding three months; and a moiety of every penalty imposed and collected under the provisions of this clause of these regulations shall belong to Her Majesty and the other moiety to the person laying the information.

(39) In order the more effectually to repress the offences specified in clauses numbers nineteen and twenty-eight of these regulations, every officer of the park, or officer of the North-west mounted police force, or constable of the North-west mounted police accompanied by or acting under the orders of a commissioned officer of the said force is hereby authorized, by force, if necessary, and without the necessity of any intervention or process of law, to enter any suspected place, to arrest therein on view any person or persons found committing any of the offences aforesaid, and to bring him or them before any of the officers who, by these regulations, are empowered to sit and act as justices of the peace within the Park to be dealt with according to law; and also to seize any tables and other instruments and money, securities for money, liquor and vessels and appliances used in connection therewith, used in contravention of the said clauses; and upon the conviction of such person or persons or any of them of such offence, in addition to any penalty imposed in respect thereof, the said table or tables and other instruments shall be forfeited and sold, or in the discretion of the convicting justice, destroyed, and the money so seized as aforesaid shall be forfeited and applied, together with the proceeds of sales towards the revenues of the park in a manner hereinafter provided.

(40) The revenues derived from every source under any of the provisions of these regulations shall be deposited forthwith to the credit of the Receiver-General on account of the park, except as otherwise herein specially provided.

(41) Printed copies of these regulations, to be furnished by the Department of the Interior for that purpose, shall be posted and kept in a conspicuous place in every government office, and in every hotel, boarding-house, bath-house and livery-stable within the park,

(42) For the control and management of the park in any matter whatsoever not specially provided for by the Rocky Mountains Park Act, 1887, or by any other Act of the Parliament of Canada applicable to the park, or by the foregoing regulations, any existing ordinances of the North-west council in that behalf shall be in force.

(43) Wherever in these regulations the expression "the superintendent of the park" or "the superintendent" is used it shall mean the officer holding that office at the present time under appointment by the governor-in-council, or any person who may hereafter be so appointed to the said office.

Mineral Lands in the Park.

The following Order-in-Council was adopted 12th October, 1892, respecting mineral lands within the Park :—

Whereas section 5 of the Act 55-56 Victoria, chaper 15, amending the Dominion Lands Act, provides that lands containing coal or other minerals, including lands in the Rocky Mountains Park, shall not be subject to the provisions of this Act respecting sale or homestead entry, but the Governor-General-in-Council may, from time to time, make regulations for the working and development of mines on such lands, and for the sale, leasing, licensing or other disposal thereof; provided, however, that no disposition of mines or mining interests in the said park shall be for a longer period than twenty years, renewable, in the discretion of the governor-in-council, from time to time, for further perio ls of twenty years each, and not exceeding in all sixty years.

His Excellency, in virtue of the provisions of the above cited Act, and by and with the advice of the Queen's Privy Council for Canada, is pleased to to make the following regulations to govern the issue of licenses of occupation for the working of mines and minerals within the Rocky Mountains Park of Canada :—

(1) Licenses to mine coal from lands within the park shall be disposed of by public competition only, and the Minister of the Interior shall, from time to time, as he may find expedient in the public interest, survey, lay out, and offer for disposal by auction or by tender, locations for the mining of coal under such licenses.

(2) The duration of such licenses shall be twenty years, unless sooner terminated by consent of the Crown and the licensee, or cancelled for non-fulfilment of conditions, and such licenses shall be renewable in the discretion of the Governor-in-Council for further periods of twenty years each and not exceeding in all sixty years, on such terms and conditions as may at the time of renewal be agreed upon by the government and licensee.

(3) The ground rent shall be $1.20 per acre per annum, payable half yearly in advance

(4) A royalty of ten cents per ton shall be paid by the licensee on all coal, taken out of the mine. Returns under oath shall be furnished quarterly to the Minister of the Interior by the licensee, showing the quantity of coal taken out and the royalty shall be paid at the time of making such returns. If the royalty which is due for one half-year equals the rental paid for that half-year, then the amount paid for rent shall be credited to such royalty.

(5) The area to be licensed to one person shall not exceed three hundred and twenty acres, and the licensee shall not make any transfer or assignment of his license without the consent in writing of the Minister of the Interior.

(6) The boundaries beneath the surface of the location shall be the vertical planes or lines in which their surface boundaries lie.

(7) The license shall be subject to the general regulations for the control and management of the Rocky Mountains Park of Canada, dated the 30th June, 1890, and to such farther and other regulations as may be made from time to time in that behalf by the Governor-in-Council.

THE ADIRONDACKS.

Forest Legislation.

A desolation like that which has overwhelmed many once beautiful and fertile regions of Europe awaits important parts of America, and other comparatively new countries over which civilization is now extending its sway, unless prompt measures are taken to check the action of destructive causes already in operation. It is almost in vain to expect that mere restrictive legislation can do anything effectual to arrest the progress of the evil, except so far as the State is still the proprietor of extensive forests. Woodlands which have passed into private hands will everywhere be managed upon the same economical principles as other possessions, and every proprietor will, as a general rule, fell his woods, unless he believes that it will be for his pecuniary interest to preserve them. In France, law has been found impotent to prevent the destruction or wasteful economy of private forests.

Fortunately for the immense economical and sanitary interests involved in this branch of rural and industrial husbandry, public opinion is thoroughly roused to the importance of the subject. Plantations of a certain extent have been made, and a wiser system is pursued in the treatment of the remaining native woods.

The people of the far west have thrown themselves into the work with much of the passionate energy which marks their action in reference to other modes of physicial improvement. California has appointed a State forester with a liberal salary, and made such legal provisions and appropriations as to render the discharge of his duties effectual. The hands that built the Pacific Railway at the rate of miles in a day are busy in planting belts of trees to shelter the track from snow-drifts, and to supply at a future day timber for ties and fuel for the locomotives. The settlers on the open plains, too, are not less actively engaged in the propagation of the woods.

It was not till 1869 that the legislature of the State of New York turned its attention to the subject of tree-planting, when it passed a law to encourage planting trees by the sides of public highways, and in 1872 created by enactment a "Commission for State Parks," whose duty was to enquire into the expediency of providing for vesting in the State the title to the timber regions lying within the Counties of Lewis, Essex, Clinton, Franklin, St. Lawrence, Herkimer, and Hamilton, and converting the same into a public park. The commission known as the "park commission" made a report recommending that no more lands lying in the counties named should be sold, but that as lands were acquired by the State through tax sales, they should be held for future forest management. The methods recommended by the commission were not acted upon until 1883, when a law was passed prohibiting further sales of lands in the counties named in the Act, and also in the counties of Saratoga and Warren. During the interval the sale of State lands had been continued, and in 1883 the State had a much less acreage in its possession than it would have had if it had adopted the recommendations contained in the commission's report as soon as they were made.

At the session of the legislature in 1884 there was appropriated $5,000 to be used by the comptroller of the State in "the employment of such experts as he may deem necessary to investigate and report a system of forest preservation." In July of that year the comptroller (Hon. Alfred C. Chapin) appointed as such experts, Prof. Charles S. Sargent, of Cambridge, Mass.; D. Willis James, Esq., of New York City; Hon. William A. Poucher, of Oswego, and Edward M. Shepard, Esq., of Brooklyn. The committee, so constituted, reported the result of their investigations, coupled with their recommendations as to future policy, to the

comptroller in January, 1885, and in forwarding their report to the legis lature Comptroller Chapin said: "The problem in its fulness affects the welfare of many sister commonwealths, and of the nation at large. It is eminently fitting that in its solution the Empire State should lead the way."

As a sequel to, and the result of the recommendations of the Comptroller's Committee, the Bill establishing the Forest Commission was passed in the following May, as follows:—

THE FOREST COMMISSION ACT.

Chapter 283, Laws of 1885; as subsequently amended..

An Act to establish a Forest Commission, and to define its powers and duties, and for the preservation of forests, passed May 15th, 1885.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:—

Commissioners, How Appointed.

Section 1. There shall be a forest commission, which shall consist of three persons, who shall be styled forest commissioners, and who may be removed by the governor for cause. The forest commissioners shall be appointed by the governor by and with the advice and consent of the Senate.

Terms by Lot.

§ 2. At the first meeting of the forest commission they shall divide themselves by lot, so that the term of one shall expire in two years, one in four years and one in six years from the first day of February next ensuing. Except as to the three terms of office thus determined, the term of office of a forest commissioner shall be six years from the first day of February on which the preceding term expires.

How Appointed After 1888.—Vacancies.

§ 3. During the month of January, in the year 1888, and in every second year thereafter, the governor, by and with the advice and consent of the Senate, shall appoint one forest commissioner. Vacancies that may exist in the office of a forest commissioner after the commencement of a term of office, shall be filled by the governor's appointment, subject to the confirmation of the Senate at its next session, for the unexpired portion of the term in which the vacancy occurs.

Commissioners, Compensation of.

§ 4. The forest commissioners shall serve without compensation, except that there shall be paid them their reasonable expenses incurred in the performance of their official duties.

Employees, and Pay of.

§ 5. The forest commission shall have power to employ a forest warden, forest inspectors, a clerk, and all such agents as they may deem necessary, and to fix their compensations, but the expenses and salary of such warden, agents, clerk, inspectors, and assistants, shall not exceed in the aggregate, with the other expenses of the commission the sum therefor appropriated by the legislature.

Rooms, Etc.

§ 6. The trustees of public buildings, under Chap. 349, laws of 1883, shall provide rooms for office for the forest commission, with proper furniture and fixtures and with warming and lights.

FOREST PRESERVE DEFINED.

§ 7. All the lands now owned, or which may hereafter be acquired by the State of New York within the Counties of Clinton (except in the Towns of Altona and Dannemora) Delaware, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Oneida, St. Lawrence, Saratoga, Warren, Washington, Greene, Ulster and Sullivan, shall constitute and be known as the Forest Preserves. except all such lands within the limits of any incorporated village or city, and except all such lands, not wild lands, as have been, or may hereafter be, acquired by the State of New York, upon or by foreclosure of or sale pursuant to any mortgage upon lands made to the Commissioners for loaning certain moneys of the United States, usually called the United States Deposit Fund, and all such excepted lands acquired by the State of New York may be sold and conveyed as provided by law.

STATE LAND CANNOT BE LEASED. CONDITIONS UNDER WHICH IT CAN BE SOLD OR EXCHANGED. APPRAISERS APPOINTED. DUTY OF COMPTROLLER.

§ 8. The lands now or hereafter constituting the forest preserve shall be forever kept as wild forest lands, and shall not be sold, nor shall they be leased or taken by any person or corporation, public or private, except that whenever any of the lands now constituting the forest preserve or which may hereafter become a part thereof, owned by the State within any county specified in section seven of the act hereby amended, shall consist of separate small parcels or tracts wholly detached from the main portions of the forest preserve and bounded on every side by lands not owned by the State, then it shall be lawful, and the comptroller shall have power to sell and convey such separate tracts or parcels, or the timber thereon, to such person or persons, corporation or association as shall have offered the highest price therefor ; but no such tracts or parcels of land or the timber thereon, shall be sold by the comptroller except upon the recommendation of the forest commission or a majority thereof, together with the advice of the attorney-general in behalf of the State. Such separate tracts or parcels of land may be exchanged by the comptroller for lands that lie adjoining the main tracts of th forest preserve upon the recommendation of the forest commission or a majority thereof, together with the advice of the attorney-general on behalf of the State ; but the values of said lands so exchanged must be first appraised by three disinterested appraisers sworn to faithfully and fairly appraise the value of said lands, and the difference if any, between the values of such parcels so proposed to be exchanged shall be paid by the party so exchanging with the State into the State treasury, but the State shall not pay the amount of any such difference. Two of said appraisers shall be nominated and appointed by the county judge of the county in which said lands proposed to be exchanged are situate or in case such lands are situate in two counties, then the county judge of each county shall nominate and appoint each one appraiser. The two appraisers so appointed shall select a third appraiser, and they shall report to the comptroller the result of said appraisal, before such lands shall be exchanged as aforesaid. The said appraisers so appointed shall receive the same compensation for their services as is provided for appraisers of decedent's estates, to be paid by the party so proposing to exchange lands with the State. It shall be the duty of the comptroller annually to report to the legislature all sales or exchanges of lands made under the provisions of this act, together with all bids and the amounts received therefor, and in said report shall be included the reports of appraisers of lands exchanged in accordance with the foregoing provisions. The proceeds of all lands so sold, or the receipts from all exchanges so made, shall be invested by the comptroller, with the approval of the forest commission, in the purchase of forest land adjoining great blocks of the forest preserve now owned by the State.

FORESTS TO BE PROTECTED AND PROMOTED.—POWERS OF LAND OFFICE AND COMPTROLLER TRANSFERRED TO FOREST COMMISSION.—RULES GOVERNING FOREST PRESERVE.

§ 9. The forest commission shall have the care, custody, control and superintendence of the forest preserve. It shall be the duty of the commission to maintain and protect the forests now on the forest preserve, and to promote as far as practicable the further growth of forests thereon. It shall also have charge of the public interests of the State, with regard to forest and tree planting, and especially with reference to forest fires in every part of the State. It shall have as to all lands now or hereafter included in the forest preserve, but subject to the provisions of this act, all the powers now vested in the commissioners of the land office and in the comptroller as to such lands as are now owned by the State. The forest commission may, from time to time, prescribe rules or regulations, and may from time to time alter or amend the same, affecting the whole or any part of the forest preserve, and for its use, care and administration ; but neither such rules or regulations, nor anything herein contained, shall prevent or operate to prevent the free use of any road, stream or water as the same may have been heretofore used, or as may be reasonably required in the prosecution of any lawful business.

OFFICERS MAY ARREST, WHEN.

§ 10. The forest warden, forest inspectors and other persons acting upon the forest preserve, under the written employment of the forest warden or of the forest commission, may, without warrant, arrest any person found upon the forest preserve violating any of the provisions of this act; but in case of such arrest, the person making the arrest shall forthwith take the person arrested before the nearest magistrate having jurisdiction to issue warrants in such case, and there make, or procure to be made, a complaint in writing, upon which complaint the magistrate shall act as the case may require.

ACTION TO RECOVER DAMAGES AND FOR TRESPASS.—TRESPASS DEFINED.—ATTORNEYS, HOW EMPLOYED.—UNDER DIRECTION OF ATTORNEY-GENERAL.

§ 11. The forest commission may bring, in the name or on behalf of the people of the State of New York, any action to prevent injury to the forest preserve or trespass thereon, to recover damages for such injury or trespass, to recover lands properly forming part of the forest preserve, but occupied or held by persons not entitled thereto, and in all other respects for the protection and maintenance of the forest preserve, which any owner of land would be entitled to bring. The forest commission may also maintain, in the name or on behalf of the people of the State, an action for the trespass specified in section seventy-four, article fifth, title five, chapter nine, part one of the revised statutes, when such trespass is committed upon any lands within the forest preserve. In such action there shall be recoverable the same penalty, and a like execution shall issue, and the defendant be imprisoned thereunder without being entitled to the liberties of the jail, all as provided in sections seventy-four and seventy-six of the said article ; and in such action the plaintiff shall be entitled to an order of arrest before judgment as in the cases mentioned in section five hundred and forty-nine of the code of civil procedure. The trespass herein mentioned shall be deemed to include in addition to the act specified in the said section seventy-four, any act of cutting or cause to be cut, or assisting to be cut any tree or timber standing within the forest reserve, or any bark thereon, with intent to remove such tree or timber, or any portion thereof, or bark therefrom, from the said forest preserve. With the consent of the attorney-general and the comptroller, the forest

commission may employ attorneys and counsel to prosecute any such action, or to defend any action brought against the commission, or any of its members or subordinates, arising out of their or his official conduct with relation to the forest preserve. Any attorney or counsel so employed shall act under the direction of and in the name of the attorney-general. Where such attorney or counsel is not so employed, the attorney-general shall prosecute and defend such actions.

INJUNCTIONS.

§12. In an action brought by or at the instance of the forest commission, an injunction, either preliminary or final, shall upon application be granted restraining any act of trespass, waste or destruction upon the forest preserve.

PARTITION.—ACTION FOR, HOW BROUGHT.—EFFECT OF.—AGREEMENT FOR.

§13. Whenever the State owns or shall own an undivided interest with any person in any land within the counties mentioned in section seven of this act, or is or shall be in possession of any such land as joint tenants or tenants in common with any person who has an estate of freehold therein, the attorney general shall, upon the request of the forest commission, bring an action in the name of the people of the State of New York for the actual partition of the said lands according to the respective rights of the parties interested therein; and upon the consent in writing of the forest commission, any such person may maintain an action for the actual partition of such lands, according to the respective rights of the parties interested therein, in the same manner as if the State were not entitled to exemption from legal proceedings, service of process in such actions upon the attorney-general to be deemed service upon the State. Such actions, the proceedings and the judgment therein, and the proceedings under the judgment therein shall be according to the practice at the time prevailing in actions of partition and shall have the same force and effect as in other actions, except that no costs shall be allowed to the plaintiff in such actions, and except that no sale of such lands shall be judged therein. The forest commission, may without suit, but upon the consent of the comptroller, agree with any person or persons owning land within the said towns jointly or as tenants in common with the State for the partition of such lands and upon such agreement and consent, the comptroller shall make on behalf of the people of the State any conveyance necessary or proper in such partition, such conveyance to be forthwith recorded as now provided by law as to conveyances made by the commissioners of the land office.

INCOME.

§14. All incomes that may hereafter be derived from State forest lands shall be paid over by the forest commission to the treasury of the State.

EXPENSES.

§15. A strict account shall be kept of all receipts and expenses, which accounts shall be audited by the comptroller, and a general summary thereof shall be reported annually to the legislature.

ANNUAL REPORT.

§16. The forest commission shall in January of every year, make a written report to the legislature of their proceedings together with such recommendations of further legislative or official action as they may deem proper.

Supervisors Protectors of State Lands, except in Forest Preserve.—Duty of District Attorney.—Supervisors to Report.—District and Forest Guards.

§17. The supervisor of every town in this State in which wild or forest lands belonging to the State are located except within the counties mentioned in section seven of this act, shall be by virtue of his office the protector of these lands subject to the instruction he may receive from the forest commission. It shall be his duty to report to the district attorney for prosecution any act of spoliation or injury that may be done and it shall be the duty of such district attorney to institute proceedings for the prevention of further trespass, and for the recovery of all damages that may have been committed with costs of prosecution. The supervisors shall also report their proceedings therein to the forest commission. In towns where the forest commission shall deem it necessary, they may serve a notice upon the supervisor, requiring him to appoint one or more forest guards, and if more than one in a town, the district of each shall be properly defined. The guard so appointed shall have such power, and perform such duties, and receive such pay, as the forest commission may determine.

Instructions in Forestry in Schools.

§18. The forest commission shall take such measures as the department of public instruction, the regents of the university and the forest commission may approve for awakening an interest in behalf of forestry in the public schools, academies and colleges of the State, and of imparting some degree of elementary instruction upon this subject therein.

Methods of Public Instruction.

§19. The forest commission shall, as soon as practicable, prepare tracts or circulars of information, giving plain and concise advice for the care of woodlands upon private land, and for the starting of new plantations upon lands that have been denuded, exhausted by cultivation, eroded by torrents, or injured by fire, or that are sandy, marshy, broken, sterile or waste, and unfit for other use. These publications shall be furnished without cost to any citizen of the State upon application, and proper measures may be taken for bringing them to the notice of persons who would be benefited by this advice.

Supervisors to act as Firewardens, when.—District Maps.—Firewardens paid by Towns.—Firewardens in Forest Preserve.—Authority of Firewardens.

§20. Every supervisor of a town in this State, excepting within the counties mentioned in section seven of this act, shall be *ex-officio* firewarden therein. But in towns particularly exposed to damages from forest fires, the supervisor may divide the same into two or more districts, bounded, as far as may be, by roads, streams of water, or dividing ridges of land or lot lines and he may in writing, appoint one resident citizen in each district as district firewarden therein. A description of these districts, and the names of the district firewardens thus appointed, shall be recorded in the office of the town clerk. The supervisor may also cause a map of the fire district of his town to be posted in some public place with the names of the district firewardens appointed.

The cost of such map, not exceeding five dollars, shall be made a town charge; and the services of the firewardens shall also be deemed a town charge, and shall not exceed the sum of two dollars per day for the time actually occupied in the performance of their duties as such firewardens. The compensation for services of the persons who may assist in extinguishing forest fires, shall be a town charge, and shall not exceed the sum of one dollar per day for each person employed; but all bills for such services must be approved by the firewarden of the town in which the fire occurred before payment shall be made. It shall be the duty of the board of auditors in each town to examine, audit, and allow promptly all reasonable bills presented to them for services and disbursements under this section. Within the counties named in section seven of this act, such persons shall be firewardens as may from time to time be be appointed by the forest commission. The persons so appointed shall act during the pleasure and under the direction of the forest commission; and there shall be applicable to them all the provisions of this act, with reference to supervisors and district town wardens. Upon the discovery of a forest fire, it shall be the duty of the firewarden of the district, town or county, to take such measures as shall be necessary for its extinction. For this purpose he shall have authority to call upon any person in the territory in which he acts for assistance, and any person shall be liable to a fine of not less than five nor more than twenty dollars for refusing to act when so called upon.

Officers, Powers and Duties of, in Case of Fire.

See Revised Statutes, Chap. 20, title 14, Part 1, Vol. 3, p. 2086.

§ 21. The forest commission, the forest warden, inspectors, the foresters, and any other person employed by or under the authority of the forest commission, and who may be authorized by the commission to assume such duty, shall within the counties mentioned in section seven of this Act, whenever the woods in any such town shall be on fire, perform the duties imposed upon, and in such case shall have the powers granted to the justices of the peace, the supervisors, and the commissioners of highway of such towns, by title fourteen, chapter twenty, of part one, of the revised statutes, with reference to the ordering of persons to assist in extinguishing fires, or stopping their progress; and any person so ordered by the forest commission, the forest warden, the forest inspectors, the foresters, or any of them, or any other person acting or authorized as aforesaid, who shall refuse or neglect to comply with any such order, shall be liable to punishment prescribed by the said title.

No Action for Trespass, When.

§ 22. No action for trespass shall be brought by any owner of land for entry made upon his premises by persons going to assist in extinguishing a forest fire, although it may not be upon his land.

Privilege, Case of Fire.

§ 23. The fire-warden, or the supervisor, where acting in general charge, may cause fences to be destroyed or furrows to be ploughed to check the running of fire, and in cases of great danger back fires may be set along a road or stream, or other line of defence, to clear off the combustible material before an advancing fire

Reports of Supervisors and Firewardens.—Summary to be Reported to Legislature.

§ 24. The supervisor of every town of which he is firewarden, as aforesaid, and in which a forest fire of more than one acre in extent has occurred within a year, shall report to the forest commission the extent of the area burned over, to the best of his information, together with the probable amount of property destroyed, specifying the value of timber as near as may be, and amount of cord-wood, logs, bark or other forest product, and of fencing, bridges and buildings that have been burned. He shall also make inquiries and report as to the causes of the fires, if they can be ascertained, and as to the measures employed and found most effectual in checking their progress. A consolidated summary of these returns by counties, and of the information as to the same matter otherwise gathered by the forest commission, shall be included in the annual report of the forest commission.

What Railroad Companies Must Do.—Remove Grass, etc.

§ 25. Every railroad company whose road passes through waste or forest lands, or lands liable to be over run by fires within this State, shall twice within each year cut and burn off or remove from its right-of-way, all grass, bush, or inflammable material, but under proper care, and at times when the fires thus set are not liable to spread beyond control.

Locomotives.—Spark Arresters.—Engineers and Firemen.

§ 26. All locomotives which shall be run through forest lands shall be provided within one year from the date of this Act, with approved and sufficient arrangements for preventing the escape of fire from their furnace or ash-pan and netting of steel or iron wire upon their smoke stack to check the escape of sparks of fire. It shall be the duty of every engineer and fireman employed upon a locomotive to see that the appliance for the prevention of the escape of fire are in use and applied, as far as it can be reasonably and possibly done.

Not to Deposit Ashes, and to Report Fires.

§ 27. No railroad company shall permit its employees to deposit fire, coals or ashes upon their track in the immediate vicinity of wood lands liable to be over-run by fire, and in all cases where any engineers, conductors, or trainmen, discover that fences along the right-of-way, on woodlands adjacent to the railroad, are burning, or in danger from fire, it shall be their duty to report the same at their next stopping place and the person in charge of such station shall take prompt measures for extinguishing such fires.

Railroad Companies.—In Case of Fire.

§ 28. In season of drought, and especially during the first dry time in the spring after the snows have gone and before vegetation has revived, the railroad companies shall employ a sufficient additional number of trackmen for the prompt extinguishment of fire. And where a forest fire is raging near the line of their road, they shall concentrate such help and adopt such measures as shall most effectually arrest its progress.

RAILROAD COMPANIES.—PENALTY FOR NEGLECT.

§ 29. Any railroad company violating the provisions or requirements of this Act shall be liable to a fine of one hundred dollars for each ofience.

RULES OF COMMISSION TO BE POSTED.

§ 30. The forest commission shall, with as little delay as practicable, cause rules for the prevention and suppression of forest fires to be printed for posting in school-houses, inns, saw-mills and other wood-working establishments, lumber camps and other places in such portions of the State as they may deem necessary. Any person maliciously or wantonly defacing or destroying such notices, shall be liable to a fine of five dollars. It shall be the duty of forest-agents, supervisors, and school-trustees, to cause these rules, when received by them, to be properly posted, and replaced when lost or destroyed.

INCENDIARIES.—PENALTIES.

§ 31. Any person who shall wilfully or negligently set fire to, or assist another to set fire to any waste or forest land belonging to the State or to another person, whereby the the said forests are injured or endangered, or who suffers any fire upon his own lands to escape or extend beyond the limits thereof, to the injury of the wood-lands of another, or of the State, shall be liable to a fine of not less than fifty dollars, nor more than five hundred dollars, or to imprisonment of not less than thirty days, nor more than six months. He shall also be liable in an action for all damages that may be caused by such fires; such actions to be brought in any court of this State having jurisdiction thereon.

APPROPRIATION.

§ 32. Fifteen thousand dollars is hereby appropriated out of any moneys in the treasury, not otherwise appropriated, for the purposes of this act. And no liabilities shall be incurred by said forest commissioners in excess of this appropriation.

§ 33. This Act shall take effect immediately.

CHAPTER 37.—LAWS OF 1890.

AN ACT TO AUTHORIZE THE PURCHASE OF LANDS LOCATED WITHIN SUCH COUNTIES AS INCLUDE THE FOREST PRESERVE.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:—

Section 1. The forest commission, with the approval and concurrence of the commissioners of the land office, may purchase lands so located within such counties as include the forest preserve, as shall be available for the purposes of a State park, at a price not to exceed one dollar and fifty cents, such approval and concurrence to be endorsed on a copy of the resolution of the said forest commission authorizing such purchase, and certified to by the clerk of said commissioners of the land office.

§ 2. The forest commission may have such lands appraised by one or more appraisers, not to exceed three in number, to be appointed by that commission. The expenses of such appraisal shall be a per diem allowance to the appraisers, not to exceed three dollars per day for the time actually employed and the necessary expenses incurred in each case, such expenses to be audited by the comptroller and paid out of the funds appropriated by the Legislature for the purposes of this act; but no purchase of lands shall be made in excess of previous appropriations for that purpose.

§ 3. The sum of twenty-five thousand dollars or so much thereof as may be necessary, is hereby appropriated out of any moneys in the treasury, not otherwise appropriated, for the purpose of this Act; and no liabilities shall be incurred by said forest commission in excess of this appropriation.

§ 4. This Act shall take effect immediately.

In returning the foregoing bill to the legislature with his signature, the governor filed therewith the following memorandum :—

STATE OF NEW YORK.

Executive Chambers, Albany, March 11, 1890.

Memorandum filed with Senate Bill No. 91, entitled: "an Act to authorize the purchase of lands located within such counties as include the forest preserve."

Approved. There is no objection to this Act. The criticism which possibly may be urged against it is that it is good enough so far as it goes, but that it is wholly inadequate to meet the requirements of the situation. It is not a broad and comprehensive measure, providing for the establishment of an Adirondack park such as is imperatively demanded by the best interest of the State, but is simply a slight step in the right direction. The authority conferred is very inadequate, the amount appropriated is quite limited, the restrictions upon the prices to be paid are likely to produce unsatisfactory results, the provisions in regard to apportionment of lands are incomplete and somewhat unnecessary, and in many other respects the measure falls short of what it was hoped the legislature might enact. The bill must be regarded as a mere temporary expedient, and, as such, can do no harm; and although it will not afford a proper and complete solution of the Adirondack Park question, it encourages the hope that in the near future a more substantial and adequate measure may be passed to fully accomplish the object recommended in my recent message to the legislature relating to this subject.

I cheerfully approve the bill, in the expectation that its enactment may lead to such a result.

DAVID B. HILL.

CHAPTER 556.—LAWS OF 1890.

AN ACT FURTHER TO AMEND CHAPTER FOUR HUNDRED AND TWENTY-SEVEN OF THE LAWS OF EIGHTEEN HUNDRED AND FIFTY-FIVE, ENTITLED "AN ACT IN RELATION TO THE COLLECTION OF TAXES ON LAND OF NON-RESIDENTS, AND TO PROVIDE FOR THE SALE OF SUCH LAND FOR UNPAID TAXES."

The people of the State of New York, represented in Senate and Assembly, do enact as follows :—

Section 1. Section seventy-four of chapter four hundred and twenty-seven of the laws of eighteen hundred and fifty-five, entitled "An Act in relation to the

collection of taxes on the lands of non-residents and to provide for the sale of such lands for unpaid taxes," as amended by chapter four hundred and fifty-three of the laws of eighteen hundred and fifty, is hereby further amended so as to read as follows:—

§ 74. The occupant of any such lot, or any other person, may, at any time before the service of said notice by the purchaser or the person naming under him, and within three years from the expiration of the two years allowed by law for the redemption thereof, redeem any land so occupied, by filing in the office of the comptroller satisfactory evidence of the occupancy required, and by paying to him the consideration money for which the land to be redeemed was sold, and thirty-seven and one-half per centum thereon, together with the sum paid for the deed, if any, and such amount as may have been paid to the State for subsequent taxes thereon, or for the redemption from subsequent tax sales thereof, and, in addition thereto, providing such lot has been legally exempt from taxation for one or more years subsequent to the sale in question, of a sum that would represent the gross amount of taxes and interest that would have been due thereon, provided it had been taxed during each of the years it may have been exempt, on its assessed valuation and at the rate per cent. of taxation thereon, for the year when last returned to the comptroller's office. In all cases of tax sales heretofore made by the comptroller, where the land sold was in the actual occupancy of any person at the expiration of the two years allowed for the redemption thereof, and the purchaser or the persons naming under him shall have failed to serve notice of such sale upon the occupant or occupants thereof, and to file evidence of such service in the comptroller's office as provided by section sixty-eight of this Act, and the occupant or any other person shall fail to file in the comptroller's office within one year after this Act shall take effect a written notice of such occupancy, together with an application for the redemption of such lands, and to furnish the comptroller with satisfactory evidence of the occupancy required, and make such redemption within two years after this Act shall take effect, then and in all such cases the said tax sales of such land, and the conveyance thereof by the comptroller shall become absolute, and the occupant and occupants, and all other persons interested in the said land, shall be forever barred from all right and title thereto.

§ 2 All Acts and parts of Acts inconsistent with this Act are hereby repealed.

§ 3 This Act shall take effect immediately.

Firewardens.

The organization of the force of firewardens in the State of New York has not been effected without considerable care and labor, it having involved the careful consideration of 281 separate appointments.

The maintenance of this system entails also a large amount of office work in the way of correspondence and in forwarding to each firewarden the necessary packages of posters, rules, and other supplies. In addition to the 281 firewardens in the counties of the forest preserve, there are the 430 supervisors in the other counties who are firewardens ex officio, with each of whom a correspondence is maintained.

No salary is attached to the position of firewarden; still the commision has succeeded in filling the places with good citizens, intelligent men who have shown themselves equal to the responsibilities devolving upon them, and have evinced a

zeal and efficiency which argues well for the future care and preservation of our forest lands.

Each firewarden, when appointed, is furnished with a warrant bearing the signature and seal of the Department.

This warrant reads as follows :—

STATE OF NEW YORK.

THE FOREST COMMISSION, ALBANY, N. Y. 189

Esq.,

Town of County of

The Forest Commision hereby appoints you a firewarden in and for your town in accordance with the provisions of the "Act to establish a Forest Commission" etc., passed May 15, 1885.

It will be your duty, as firewarden, whenever a forest fire occurs within the limits of your town, whether it be on State or other lands, to promptly notify a sufficient force to assist you ; to go to the place where the fire is burning, and to take charge of and to direct the work necessary for extinguishing it. All persons in the territory whom you may order to render you such assistance, are required by law to obey your order, and any person who may refuse to act in obedience to your order is, by statute liable, to a fine of not less than five nor more than twenty dollars.

If a forest fire occurs in your vicinity, although it may be in the adjoining town, it will be as much your duty to go immediately to the place of such fire as if it were in your own town ; and, in the absence of the fire warden of the town within the limits of which such fire may be, to assume the same authority and to discharge the same duties that you are empowered to assume and discharge in your own town, until the arrival of the fire warden of that town, upon which you will turn over all charges of the fire to him.

The same diligence and exertion must be used for the extinction of forest fires on private lands as on lands of the State. The public welfare requires that all forests should be protected from fire, no matter to whom they may belong.

After a forest fire has occurred in your town you must make a report of the same to the forest commission, stating the date and place of the fire, the number of acres burned over, the amount and nature of the damage, and the cause of the fire if known.

Your attention is called to the provisions of the twentieth section of the Forest Commission Act, for dividing your town into fire districts. Action theron, is left to your own discretion ; but if taken, you should report it to the commission.

It is essential that the rules and regulations of this commission, governing the methods of preventing and extinguishing forest fires, should be made fully known to the public. To that end you will be required to post, and keep posted, the cards containing the printed rules throughout your town, conformably to the provisions of section 30 of the before mentioned Forest Commission Act, and wherever you may judge it to be necessary in order to accomplish a complete public notification. Such posted cards, as may, at any time, be missing should be replaced at once. The cards will be furnished to you, and you can always be supplied with them on application to the commission.

A fire warden is required, by law, to be a resident of the town for which he is appointed. If you do not reside in the town, herein named, or if you should hereafter change your residence to another town, please notify this commission at once.

The office of a firewarden is distinct from that of a forester. Firewardens are not required to discharge any duties except those necessary for the prevention and extinction of forest fires, as before explained, and such other duties for a like purpose as may be, from time to time, assigned to them by this commission.

It is provided, by statute, that the pay of a firewarden for his official services shall not exceed the sum of two dollars a day for the time that he may be actually employed; and also, that the bills of firewardens shall be paid by their respective towns. You are to render all your bills for services to your town and if you have any difficulty in having such bills audited and paid you should notify the forest commission.

This appointment is tendered to you in reliance upon a recommendation in which this commission places confidence. Should you accept the appointment, you are expected to discharge the duties of your office zealously, faithfully, in full compliance with the letter and spirit of the forest commission Act, and of the rules of the commission (both of which you are asked to read carefully), and in a manner at once honourable to the forest commission and yourself.

Be kind enough to inform the commission immediately, whether you accept or decline your appointment; and in case that your acceptance is not forwarded within thirty days from date, you will be understood as declining.

By order of the Forest Commission.

(L.S.) Secretary.

Rules and Regulations.

These are printed on heavy cards 12x15 inches. Latterly they have been printed on white muslin, as this material has proved more durable, the most of the placards being posted in the woods, or on fences, school-houses and mills, where they are exposed to the weather. Over 15,000 of these rules have been posted by the foresters and firewardens throughout the preserve counties, and the commission believes that much of the immunity from fire is due to their general distribution. They have been an important aid in warning the careless, and in educating the people in this particular.

Much of the force and value of these regulations is lost because there is no penalty attached to their violation; and the commission is not authorized to add any clause in this respect.

Rules for the Prevention and Suppression of Forest Fires and for the Protection of Forest Trees.

(Established by the Forest Commission.)

1. All persons intending to light fires for the purposes of clearing or improvement, must give notice of their intention to the nearest firewarden before such fire is lighted, They must also give notice to all owners or occupants of adjoining lands, at least forty-eight hours before lighting such fires, which will be permitted only when the wind is favourable.

2. No fires, of the character before specified will be permitted until the trees are in full leaf. After such fires are lighted competent persons must remain to guard them until the fire is completely extinguished.

3. Fires will be permitted for the purpose of cooking, warmth, and insect smudges; but before such fires are kindled, sufficient space around the spot where the fire is to be lighted must be cleared from all combustible material; and before the place is abandoned, fires so lighted must be thoroughly quenched.

4. All fires other than those hereinbefore mentioned, are absolutely prohibited.

5. Hunters and smokers are cautioned against allowing fires to originate from the use of firearms, cigars, and pipes; and all persons are warned that they will be held responsible for any damage or injury to the forest which may result from their carelessness or neglect.

6. Felling trees, and girdling or peeling bark from standing trees, are prohibited. Fallen timber only, may be used for firewood and camp construction.

7. Foresters and firewardens are instructed, and all citizens are requested, to report to the forest commission immediately all cases of damage or injury to forest trees arising from a violation of these rules which may come to their knowledge.

Beneath these rules, and on the same placard are printed sections 10, 30 and 31 of the Forest Commission Act, and the following:—

Section 74 (as amended by chapter 256, Laws of 1889):—

Every person who shall trespass on any lands belonging to the people in this State, or on any Indian lands, or who shall trespass upon any other lands within the bounds of the forest preserve, or which may hereafter be included in the forest preserve, by cutting or carrying away timber growing thereon, shall forfeit and pay the sum of twenty-five dollars for every tree that shall be cut or carried away by him or under his direction.

From the Penal Code.

414. A person who, having been lawfully ordered to repair to the place of fire in the woods and assist in extinguishing it, omits, without lawful excuse, to comply with the order, is guilty of a misdemeanor, and shall forfeit the sum of fifty dollars and be liable to a fine and imprisonment.

640. *Malicious injury and destruction of property.*—A person who wilfully cuts down, destroys or injures any wood or timber standing or growing or which has been cut down and is on lands of another or of the people of the State; or cuts down, girdles, or otherwise, injures a fruit, shade, or ornamental tree, standing on the lands of another or of the people of the State, is punishable by imprisonment not exceeding three months, or a fine not exceeding two hundred and fifty dollars, or both.

REASONS FOR ESTABLISHING ADIRONDACK PARK.

The following account of the reasons which induced the people and Legislature of the State of New York to undertake the work of establishing a great Park among the Adirondack mountains. and of the means which have so far been adopted, is condensed from the reports of the New York Forest Commission for 1890 and 1891 :—

In pursuance of a resolution of the Senate adopted January 20th, 1890, the committee on finance recommended the adoption of the following concurrent resolutions :—

Resolved, (if the Assembly concur) "That the forest commission be and hereby is, directed to take into consideration the message of the Governor, addressed to the legislature, calling attention to the subject of establishing a State park in and about the headwaters of the rivers having their sources in the Adirondack wilderness, and after thoroughly investigating the possibilities of such an undertaking, to report to the legislature its conclusion thereon and its recommendations as to the most effective methods to be employed to accomplish that end—either by bill, or otherwise—together with any pertinent facts within the knowledge of the commission relating to the general subject of forest preservation or extension, and further to report the number of acres or square

miles of land essential to fulfilling the requirements of a suitable reservation or park, and the probable cost thereof, and to report also in regard to the other subjects referred to in said message of the Governor."

The concurrent resolution reported by the committee was passed by the Senate, March 5th, 1890, and by the Assembly, April 4th, 1890.

The commission of State Parks made a report in 1873, from which the following is an extract, "It has been shown that the forests protect and preserve the springs and streams among them; and when we find individuals managing their property in a reckless and selfish manner, without regard to the vested rights of others, it becomes the duty of the State to interfere and to provide a remedy. Here, by ruthless destruction of the forest, thoughtless men are depriving the country of a water supply which has belonged to it from time immemorial and the public interests demand legislative protection. The canal interests of the State are very great, and are already suffering from this wrong. The water supply of the Champlain canal is entirely obtained from the streams of this wilderness, and the Erie canal, from Rome to Albany, is almost entirely supplied from the same watershed. In the Hudson, near Troy and Albany, navigation at midsummer has become very difficult. The mill-owners at Glen's Falls and at other points find that their water supply is failing; and the farming lands throughout the State suffer from storms and droughts of increasing severity. It is of no consequence, that, through ignorance of the natural law governing rain and rivers, men have hitherto permitted without protest, the injustice which they felt but the cause of which they did not understand. The State must apply the remedy, and to protect their interests preserve the forest. The great Adirondack forest has a powerful influence on the general climatology of the State; upon the rainfall, winds and temperature, moderating storms, and equalizing throughout the year the amount of moisture carried by the atmosphere, controlling and in a measure subduing the powerful northerly winds, modifying their coldness and equalizing the temperature of the whole State."

The commissioners say, in concluding their report:—

"There is no need for any expenditures save possibly in the improvement of a few of the principal roads leading to the settlements. The forest is in itself a natural park, and it would be improper to think of enclosing and fencing it for it should be a common unto the people of the State. The question before your Commission is one of great importance to the State, and requires their further consideration. For the present we deem it advisable and recommend that the wild lands now owned and held by the State be retained until that question be decided."

Under the resolution passed by the Legislature of 1890, the forest commission found itself confronted by four main topics for its examination and decision.

First—Is the establishment of a State park in the Adirondack wilderness feasible?

Second—If it be, what shall be the area of the park?

Third—What lands shall be embraced within the park?

Fourth—How shall the lands that ought to be included within the park, and not owned by the State, be acquired?

A survey of the actual condition of affairs showed that the region popularly known as the Adirondacks is diversely estimated at widely different areas. Taking the most reliable data, the gross area of the Adirondack wilderness proper is shown now to be about 5,600 square miles, or 3,600,000 acres This includes the area of water (lakes, ponds and rivers), overflowed lands, clearings, farms and some villages, or settlements. This area is by no means a compact tract, but lies in widely separated parcels, varying in extent from one-quarter of

an acre to 70,000 acres, interspersed among tracts held by individuals and corporations (mostly lumbermen and paper manufacturers), an unknown number of clubs or other associations and persons who have established private preserves and parks in the woods for purposes of pleasure and recreation and of hotel sites. How to consolidate the lands necessary to form a park became a serious question. Only two methods were suggested. One that the State should condemn and take the land necessary to form the park by the exercise of its right of eminent domain; the other that the State should acquire the land by purchase.

A leading representative of the lumber interest, who has made the subject of forestry and timber supply and consumption a matter of study both in this country and in Europe, said to the commissioners: "It seems to me there is a practical side to this subject that should have some consideration. I have tried this summer to make a sufficient study of the way they have been managing forests in general. I have studied the German system, and have become very much interested in it. If it is possible to raise the money there is no question but what it would be the better way if the State could buy the lands outright and own them, but it is a great question whether the sum of money required for this could be raised at once, and my hope is that some plan will be devised by which the land can be bought at a low price, say about three dollars an acre, and allow the spruce to be taken out down to twelve or fourteen inches. If that was done the State would acquire the lands at a comparatively low price. The spruce below the twelve inch limit in a few years would grow up so that second cutting could be done, and within fifteen or twenty-five years I think the whole lands purchased by the State could be paid for with interest and cost the State nothing. The German forests that I have visited, paid last year some six or seven million dollars to the German government. I see no reason why our lands cannot be treated in the same way. The trouble with us is we are always afraid of planning out for anything seventy-five years ahead. If you went to the legislature and said you wanted to spend several millions of dollars, and political questions came up, you would kill the whole thing. What I am afraid of is that the railways are bound to come in. The land is not owned by the State. Suppose you own the land, you are able to prevent any roads going through. It might be that if they went through they would increase the value of your land. If the land is not owned by the State the railroad cannot be stopped. There is no question but that railroading does hurt the Adirondacks. The only advantage of their going through is that it would bring the whole of the Adirondacks closer together. This would be for the advantage of the rich and the poor alike. It would give the poor clerks and poor people an opportunity to go up there and live at low rates. As it is now, they have got to have guides and go to a large expense. My hope is that something will be done in the way of buying the land at low prices. There are 25,000 people in the Adirondacks who are depending for their living upon the different operations in lumber and who are in favor of this park, and will work in the interest of this scheme if they think they will not lose their livelihood."

The commissioners go on to say that a misunderstanding has prevailed to some extent with regard to the attitude of forestry to the lumber interests of private owners. It is, however, generally understood now that the true interests of the lumbermen are not incompatible with forest preservation, and it has been declared to be one of the objects of the forestry movement in this country "to harmonize the interests of the lumberman and the forester, and to devise for the lumbering interest such protection as is not given at the cost of the forests." Forestry is not opposed to having trees cut down in the proper way. They must be cut to supply the world with timber. Civilization could hardly exist without

it. It is from trees, and from trees only, that our needs for wood are supplied through the timber dealer and the lumberman.

The phrase, "lumbered land," is a somewhat misleading one. It does not imply that such land is cleared, devastated, or even stripped of timber. The term is used locally to describe lands from which the "soft wood" (spruce, hemlock, pine and tamarac, one or all) has been taken, leaving the hard wood (birch, cherry, maple, beech, etc.) standing.

Generally, there is so much of this hardwood left on a "lumbered" tract that an inexperienced eye glancing over it would scarcely detect the work of the axe. The woodman expects to see such land covered with spruce again, large enough to be marketable, in about fifteen years.

Even the denuded forest lands to which reference is made are usually sufficiently well covered with a light growth of poplar and shrubs of various kinds to play a serviceable part in the purposes of forestry, and they will largely, if preserved from fire, be reclaimed by the forest.

The questions as to the area of the park and the lands that ought to be embraced within its limits have received much consideration from the commission, and as in the case of other questions a decided difference of opinion has been found to exist upon them.

The suggestion of the governor in his messsage of January, 1890, was that the area of the park should be "from fifty to seventy miles square." The smaller area mentioned would contain 2,500 square miles, or 1,600,000 acres, and the larger area 4,900 square miles, or 3,136,000 acres. The minimum area for the park that was suggested to the commission was 1,600 square miles, or about 1,000,000 acres, while most have urged larger areas, ranging from 2,500,000 to 4,000,000 acres.

The objects to be gained by establishing the park are stated by its various advocates in varying language, although perhaps agreeing in substance. One of the purposes is alleged in general terms to be "the preservation of the forests." The benefits derivative from forest preservation are stated as the maintenance of our timber supplies, the conservation of the sources of our rivers by the protection of watersheds, the protection and preservation of fish and game, and the founding of a permanent public resort for those seeking pleasure and rest, and which shall also be a sanitarium for invalids.

The commissioners reported that the loss to the State of New York which would be entailed by the destruction of the Adirondack forest, taking into account the manufacturing and canal interests involved, could only be counted by millions of dollars, and this, without taking into consideration the loss to the health of the citizens by the removal of the most valuable of all sanitariums, and the destruction of the valuable game preserves of the Adirondacks, and they unanimously recommended that the legislature should enact the necessary and suitable laws for the establishment and management of a park in the Adirondack wilderness, for the reasons and upon the general basis set forth in their report.

THE ADIRONDACK PARK ACT.

The Act which was passed by the State Legislature, 20th May, 1892, respecting the Adirondack Park, is as follows:—

The people of the State of New York represented in Senate and Assembly do enact as follows:—

Section (1) There shall be a State park established within the Counties of Hamilton, Herkimer, St. Lawrence, Franklin, Essex and Warren, which shall be known as the Adirondack park, and which shall, subject to the provisions of this

Act, be forever reserved, maintained and cared for as ground open for the free use of all the people for their health or pleasure, and as forest lands necessary to the preservation of the headwaters of the chief rivers of the State, and a future timber supply.

(2) For this purpose the forest commission shall have power, as herein provided, to contract for the purchase of lands situated within the County of Hamilton, the Towns of Newcomb, Minerva, Schroon, North Hudson, Keene, North Elba, St. Armand and Wilmington, in the county of Essex; the Towns of Harrietstown, Santa Clara, Altamont, Waverly and Brighton, in the County of Franklin; the Town of Wilmurt, in the County of Herkimer; the Towns of Hopkinton, Colton, Clifton and Fine in the County of St. Lawrence; and the Towns of Johnsburgh, Stony Creek and Thurman, in the County of Warren.

(3) In any case where lands are situated within the towns specified in section two, the purchase of which lands will in the opinion of the forest commission, be advantageous to the State, but which cannot as shall appear to the satisfaction of the forest commission, be bought on advantageous terms unless subject to leases or restrictions, or to the right to remove certain timber as hereinafter mentioned, the forest commission may make a contract for the purchase of such lands, providing that the contract and the deed or deeds to be made in pursuance thereof, shall be subject to such leases, restrictions or right. But no lands shall be so purchased subject to any right to remove hard-wood timber, or any trees of soft-wood with a diameter of less than ten inches at the height of three feet from the ground, or subject to any rights, leases or restrictions, or the right to remove any timber after the period of ten years from the date of the conveyance.

(4) The forest commission shall have power, from time to time, due notice having been given, to contract to sell and convey any portion of the lands within so much of the forest preserve as is now, or hereafter may be situated within the Counties of Clinton, Fulton, Lewis, Oneida, Saratoga, Washington, St. Lawrence, Franklin (except the Town of Harrietstown), Herkimer (except the Town of Wilmurt), Essex (except the Towns of Newcomb and North Elba), the Town of Hope in the County of Hamilton, and the County of Warren (excepting, however, therefrom, all islands in Lake George, and all land upon the shore thereof), the ownership of which by the State is not, in the opinion of the forest commission, needed to promote the purpose sought by this Act, or by chapter two hundred and eighty-three of the laws of eighteen hundred and eighty-five. The proceeds of all such sales, as in this section provided, shall be paid to the treasurer of the State, and shall be held by him in a separate fund and as a special deposit, which shall at all times be available to the forest commission for the purpose of purchasing lands situated within the towns mentioned in section two of this Act at such price per acre as may be determined by the forest commission and approved by the commissioners of the land office as hereinafter provided.

(5) All conveyances of lands belonging to the State which are to be delivered in pursuance of any contract authorized by section four, shall be executed by the comptroller and may contain such restrictions, reservations or covenants as the forest commission shall deem to be promotive of the purposes sought by this Act, or by chapter two hundred and eighty-three, laws of eighteen hundred and eighty-five. No contract made in pursuance or under the authority of this Act shall take effect until the same shall have been approved by the commissioners of the land office, such approval to be appended to the copy of the resolution of the forest commission authorizing such contract and certified by the clerk of the commissioners of the land office.

(6) Every conveyance executed in pursuance of this Act shall be certified by the attorney-general to be in conformity with the contract, and shall otherwise be approved by him as to form before the acceptance or delivery thereof. Every conveyance to be received by the forest commission, and executed in pursuance or under the authority of this Act, shall be made to the people of the State of New York as grantee, and shall be recorded in the proper county or counties, and shall after such record, be delivered by the forest commission to the commissioners of the land office to be treated as part of their archives.

(7) Payment for the purchase of land authorized by this Act, shall be made upon the certificate of the forest commission and the audit of the comptroller from moneys appropriated by this Act for the purchase of land or from moneys received from the sale of lands as provided in section four. Such expenses as may be necessarily incurred by the forest commission in the preliminary examination of lands purchased or sold under the authority of this Act, or in the examination of title of lands purchased under this Act, and all other expenses incidental to the conveyances and purchases so made shall be paid by the forest commission from the appropriations made from time to time for the purpose of such purchases, or from the fund established from the proceeds of the sale of lands as provided in section four.

(8) All lands now owned, or which may hereafter be acquired by the State within the towns mentioned in section two of this Act (except such lands in border towns as may be sold in accordance with the provisions of section four), shall constitute the Adirondack park. The forest commission shall have the care, custody, control, and superintendence of the same, and shall have within the same and with reference thereto and every part thereof, and with reference to any acts committed thereon and persons committing the same, all the control, powers, duties, rights of action, and remedies now belonging or which shall hereafter belong to the forest commission or the commissioners of the land office, within, or with reference to, the forest preserve or any part thereof, or with reference to any acts committed therein, or persons committing the same. The forest commission shall have power to prescribe and to enforce ordinances or regulations for the government and care for the Adirondack park, not inconsistent with the laws of the State of New York, or for the licensing or regulation of guides or other persons who shall be usually engaged in business thereon; to lay out paths and roads in the manner prescribed by law; to appoint the superintendent, inspectors, foresters and all other officers or employees who are to be engaged in the care or administration of the park and to fix their compensation, the same to be payable, however, only out of the appropriations made from time to time for the expenses of the forest commission.

(9) The forest commission shall have power to lease from time to time, as it may determine, tracts of land within the limits of the Adirondack park, not exceeding five acres in any one parcel to any person for the erection of camps or cottages for the use and accommodation of campers, such leases to be general in form except as to the term and amount of rental, and the term not to exceed five years, and the leases to contain strict conditions as to the cutting and protection of timber, the prevention of fires, and a reservation of a right of passage over the same for travellers at all proper and reasonable times, and to contain a covenant on the part of the lessee or lessees to observe the ordinances or regulations of the forest commission, theretofore prescribed or thereafter to be prescribed, as the same may be from time to time. No exclusive fishing or hunting privilege shall be granted to any such lessees.

(10) Except as in this act otherwise provided, the Adirondack park shall for all purposes, be deemed a part of the forest preserve. All laws for the pro-

tection of the forest preserve shall be applicable to the Adirondack park, except as in this act otherwise provided; and the forest commission may conduct the same prosecutions and institute and maintain the same proceedings, which it is, or shall be entitled to conduct, institute or maintain with reference to any portion of the forest preserve; and all acts forbidden upon the forest preserve are, and shall be deemed forbidden within the Adirondack park except as herein otherwise provided; and all violations of law upon the Adirondack park shall be subject to the same punishments and penalties as if such violation were committed upon any part of the forest preserve.

(11) The foresters and other employees of the forest commission shall, when so directed by the forest commission act as game and fish protectors; and as such they shall have all powers within the Adirondack park which game and fish protectors have or shall have, under chapter five hundred and seventy-seven of the laws of eighteen hundred and eighty-eight, and any law hereafter to be enacted, and they shall from time to time make such report to the commissioners of fisheries as that board may require. Nothing in this act contained shall be construed to permit any violation within the Adirondack park of the game and fish laws of the State heretofore or hereafter to be enacted, or to restrict or alter as to such park any of the prohibitions or penalties prescribed or hereafter to be prescribed by such fish and game laws. It shall be the duty of the forest commission with the concurrence and approval of the commissioners of fisheries, to provide for the enforcement within the Adirondack park of such fish and game laws by such means as the forest commission shall deem wise, in addition to such other means as are or shall be provided by law.

(12) The forest commission shall include in its annual report an account of its proceeding with reference to the Adirondack park, and shall make such recommendations with reference thereto as it shall deem wise. The forest commission shall state also in its annual report the number of acres purchased and sold during the year under the provisions of this act, the locality of the same, the prices paid or received, and all other information of importance connected with such transfers; and shall state the amount of money required in the next fiscal year for the purchase of lands and for the expenses of the park.

(13) Chapter four hundred and seventy-five of the laws of eighteen hundred and eighty-seven, and all acts and parts of acts inconsistent with this act are, so far as they are so inconsistent, hereby repealed.

(14) This act shall take effect immediately.

PUBLIC UTILITY OF THE PARK.

The Commissioners in their report for 1891, go on to say:—

"At this late day, after all that has been written and said on the subject, we do not propose to discuss the necessity of forest preservation and the acquirement of the Adirondack wilderness by the people. Throughout the entire State there is a demand for this which is continuously urged by the newspapers, the local forestry associations, and by a general, widespread expression of public sentiment. Among all the demands and arguments in favour of this project, a dissenting voice has not yet been heard. If there have been such, they arose from questions of detail only.

"The original idea called for forest preservation, with reference only to protecting the head waters of our rivers, and providing a future economic and perpetual timber supply. But lately the acquisition of this territory has been urgently demanded by the public for the purposes of a health and pleasure resort, and the original movement has become largely subordinate to the latter one.

"It is immaterial whether it be called a park or a forest preserve, and its use as a pleasure or sanitary resort need not interfere with its management for forestry purposes. The friends of the forestry movement, therefore, view with pleasure the agitation in favour of the Adirondack park, and welcome the promoters of that enterprise as needed allies in the work of acquiring the necessary land.

"Section three of the Act provides for the purchase of land on which there is a growth of merchantable soft wood. Such lands are, for the most part, owned by lumbermen who will not—in fact, could not, part with such lands without abandoning their business. The State cannot acquire any tracts of this character except by the exercise of the right of eminent domain, an arbitrary measure which should not be resorted to until all other methods have failed. Moreover, there is no reason to believe that a bill authorizing the condemnation of the property of the lumbermen in northern New York could be passed. But the lumbermen have, so far as we can learn, expressed a willingness to turn over their lands to the State at a low price, provided they could have the privilege of removing the small proportion of trees comprising the merchantable soft wood. Now, the lumbermen will certainly remove such timber from their lands, sooner or later, and the forest commission see no possible way of preventing it. The only question is: Shall we secure these lands now, subject to the removal of the soft wood, or wait until it is removed and then attempt to buy the land?

"After several years' observation and experience in this very matter, we believe the delay will only result in the State paying higher prices for these same lands, the soft wood having been removed in the meantime just the same. Six years ago prominent lumbermen called at the office of the forest commission and offered to organize a syndicate that would furnish the State half a million acres of Adirondack forest land for the nominal sum of one dollar (not one dollar per acre), provided that they could have the privilege of removing the soft wood and be relieved of the taxes. We are now willing to pay $750,000 for the same land which was offered to us then for one dollar, and pay it subject to the same conditions. Further delay in this matter will only result in the State paying higher prices and under more stringent conditions. It is the old story of the Sybilline books. There seems to be some misapprehension as to the result of the clause permitting the removal of the soft wood. The trees which would be removed under the sanction of section three of the proposed act would not exceed, on an average, eight trees to the acre. Their removal would not affect the general appearance of the forest, would not diminish the area of foliage, or lessen its value as a protection to the watershed of our rivers. The hard wood trees and young evergreens would still remain. There would be many lots on which scarcely a tree would have been removed under this clause; although there might be, here and there, a few lots on which, by reason of the spruce growing in thick masses or so called "clumps" there would be a perceptible thinning. But even in the latter case the young trees would in a few years attain a growth which would cover all traces of previous operations, and under a properly conducted forestry management, furnish future revenues to the State.

"This commission does not consider it necessary to argue in favour of a policy which has already received the sanction of the best thought of the country. In 1873 a commission, headed by the late Governor Horatio Seymour, made a report strongly urging the reservation of the Adirondack wilderness.

"On January 22, 1890, Governor David B. Hill forwarded to the legislature a special report urging the establishment of an Adirondack park and the purchase of lands necessary to such purpose, his message outlining substantially the provisions adopted in the foregoing Act. In that message he urged that the limits, within which lands are to be obtained by the State for this purpose, should be

settled and defined; and that all the lands outside these limits should be subject to sale. He recommended that the area of the State park should be from fifty to seventy miles square, the mean area of 2,847,000 acres corresponding with the amended boundaries now proposed by the commission. He also recommended that the State give permission to persons desirous of building summer camps upon State lands; and that small parcels should be leased under suitable restrictions at a moderate rental for such purposes, arguing that such occupants would have an interest in preserving the forests in all their beauty, and would be the best of firewardens or foresters; and that the wilderness would thus afford a summer home to persons of moderate means as well as to the wealthy.

"In the same year a committee of the State Senate reported that there could be no dissent from any of these propositions; and that 'it is admitted that the creation of such a park would be of incalculable benefit to the State and the whole country. The claims of the tourist and the summer resident for a great public reservation, where the worker, the traveller and the lover of nature may find rest, recreation and recuperation, great as they are, sink into insignificance beside the acknowledged fact that the preservation of the Adirondack forest, which can only be accomplished by the liberal action of the State, promptly taken, is a sanitary necessity. Consideration for the invalid, who, according to eminent authority, finds here a refuge of unsurpassed value, and regard for the public health and protection of vast commercial and manufacturing industries depending upon the Adirondack forests for even and seasonable distribution of the rainfalls of that region, alike counsel action in this matter, immediate, liberal and comprehensive.'

"The report of this committee was signed by the Hons. George B. Sloan, Charles T. Saxton and J. S. Fassett. Further than this, the various forestry associations of the State of New York, and the boards of trade in various prominent cities, together with the entire press of the State, have unanimously and persistently urged that the legislature no longer delay action in this matter, and that their action, when taken, should be comprehensive and proportionate to the magnitude of the interests involved.

"Section 5 provides for the purchase of lands in the Catskill Mountains. The law of 1885, establishing the forest preserve, contemplated a reservation in the Catskill as well as in the Adirondacks, and not without good reason.

"As one of the primary objects of forest preservation is the protection of the watersheds of our chief rivers, the wooded slopes of the Hudson watershed demand special consideration. The four counties of Greene, Ulster, Delaware and Sullivan contain mountains whose forests protect the head waters of important streams that flow to the Mohawk, the Hudson, and the Delaware. The Schoharie creek, which takes its rise in the Catskill Mountains, is a large stream that flows northward and joins the Mohawk River at Tribes Hill, its waters flowing thence to the Hudson. This stream is also utilized as an important feeder to the Erie Canal. The Esopus Creek also rises in the Catskill Mountains and flowing to the north and east pours its waters into the Hudson at Saugerties. This stream is valuable for its water power, which is used to advantage by the manufactories situated near its mouth. The east and west branches of the Neversink, and the east branch of the Delaware also rise here. The State has already about 50,000 acres of forest land in these four counties, the bulk of which is situated on and near Slide Mountain, in Ulster County, the highest peak in the Catskills.

"But there are more important reasons for the establishment of a forest park in the Catskills. This portion of the preserve is in close proximity to the great cities of New York and Brooklyn, and the many cities along the Hudson. It is easily accessible to three-fourths of the population of the State, and receives

annually a far greater number of summer visitors than the famous Adirondack region. It is a favorite spot with the vast populations of New York and Brooklyn on account of its accessibility, cheap railroad fare, and desirable accommodations for people of moderate means.

"Still, aside from all such reasons, the acquisition of forest lands in the Catskill Mountains is necessary for forestry purposes, and for the preservation of an important watershed.

FOREST FIRES.

Under this heading the Commissioners in their report for 1891 say:—

"Forest fires in this State during the past year have done but little damage as compared with the destructive conflagrations which raged within the wooded districts several years ago, prior to the organization of the present firewarden system. That the succeeding reports show a greater number of fires than last year, is due to the fact that extra effort has been made this season to secure reports from every town in the State. A large number of fires reported this year, it will be noticed, were checked soon after they started and before any serious damage was inflicted; and the large number of such cases is encouraging evidence of the value and efficiency of the organization. In gathering these reports an effort was made to make the statistics on this matter perfect and complete. To this end a correspondence was maintained with the 900 firewardens, including the town supervisors who act as such within the towns outside the forest preserve, all of the woodlands thoughout the entire State, whether private or public, being under the charge of the forest commission in this respect. This correspondence was pushed until every town in the State had reported, the firewardens being directed to report the absence of fire as well as cases where they had occurred. It will be noted with interest that the principal causes of these fires were not the ones which had hitherto been claimed as such. In no case have they been reported as originating in lumbering operations, or in the "slash" left by log choppers. The most frequent source is found in petty farming operations, and the burning of fallows; and, next the railroads and locomotives were a prolific cause. The campers and sportsmen seem to be responsible next, while the remaining instances were due to various and sometimes unknown causes.

"In cases where the fire was discovered as soon as started, and a posse of men was promptly warned out, there was no difficulty in extinguishing it; but where, by reason of delay, the fire got well started, it was impossible to put it out, and the efforts of the firewarden and his men were confined to checking any further spread, and to watching it until the rain could accomplish the work. The unfailing regularity with which the larger fires were followed by rain was a noticeable and interesting fact. The system and the work done under it, is however, far from perfect as yet, but each year has brought with it better methods and a more effective organization. The commission feels encouraged, and believes that the present system can be perfected and the laws enforced so that extensive forest fires in the State of New York will be a rare occurrence.

"In one case a serious fire was started by an incendiary. This occurred May 14th, near Indian Lake, Hamilton County, and the person started his fire in the windfall of dead timber and tree tops left by the cyclone of 1888. As this fire was clearly of incendiary origin, the forest commission offered a reward of $300 for information which would lead to the conviction of the person or persons who set fire to this slash. The printed hand-bills containing the announcement of this reward were conspicuously posted and freely distributed throughout the

country; but the officers of the commission were unable to obtain any clue what ever to the perpetrator of the crime.

"Another incendiary fire was started in Franklin County, near Loon Lake, May 2nd, a full report of which, made by firewarden Chase, will be found on a subsequent page.

"The miscreants who start these fires have every opportunity for accomplishing their work without fear of detection. They enter the forest alone and unobserved, start a fire, and then, aided by their knowledge of the wilderness, emerge at some point many miles distant. These incendiary fires are the cowardly means resorted to in revenge for fancied wrongs; and it is an unpleasant fact to contemplate that in certain localities the forest is at the mercy of any lawless man, who, brooding over imaginary grievances, or inflamed by ignorant passion or drink, seeks to gratify a revengeful spirit by this dire resort. One need not travel far in the Adirondacks before the ear will catch the discontented muttering and significant threats which leave no doubts as to the danger from this source.

"From the table given it appears that of eighty-nine fires reported, the causes were:—

From clearing land	22
From railroad locomotives	10
From railroad track hands	3
From hunters and fishermen	9
From mischievous boys	5
From incendiaries	4
From camp fires	3
From mosquito smudge	1
From tobacco smoking	3
From sparks from saw-mill	1
From causes not stated	14
From causes unknown	14
Total	89"

SANITARY BENEFITS OF THE ADIRONDACKS.

The advantages of the Adirondack Park as a health resort are becoming recognized. On this point the Commissioners in their report for 1891 have the following:—

"Information regarding the sanitary benefits of the great forest is so largely sought after that, at the risk of repetition, we quote from one of our previous reports:—

"The sanitary value of our forests cannot be over-estimated. In addition to their furnishing a summer resort for the over-crowded population of our towns and cities, a place where rest, recuperation and vigour may be gained by our highly nervous and over-worked people, the healthful and purifying influence of coniferous forests has been thoroughly established.

"The testimony, based on personal, careful and scientific investigation of such men as Dr. E. L. Trudeau, of Saranac, cannot be set aside. Himself an invalid restored to health by forest life, he has devoted himself to the question of environment, in its relation to tuberculosis, and by experiment on living animals, has demonstrated the value of the terebinthine forests of the Adirondack region as a factor in warding off pulmonary diseases. He says:—

Twenty-five per cent. of the patients sent to the Adirondacks suffering from incipient consumption come back cured, a proportion only surpassed by the State of Colorado. As a sanitarium for the State and City of New York alone, the value of this region is inestimable, and many professional men will be at a loss where to send their suffering patients who are unable to pay the expenses of a trip to Colorado or California, unless some steps be immediately taken to save to the State this heritage that should be preserved for the people.

"Dr. Alfred L. Loomis, of New York, (an eminent authority) has also given valuable scientific testimony to the value of evergreen forests as a therapeutic agent in lung affections. He writes:—

"'Having long since been convinced by my observations that evergreen forests have a powerful purifying effect upon the surrounding atmosphere, and that it is rendered antiseptic by the chemical combinations which are constantly going on in them, I invite attention to some conditions which may explain their therapeutic power. Such ambiguous terms as 'balsamic influence,' 'health-giving emanations' and 'aromatized atmosphere,' must be regarded as empty phrases, and meaningless as scientific explanations. The clinical evidence, however, of the beneficial effects of pine forests, on phthisical subjects is unquestionable. The changes attributable to the persistent inhalation of air impregnated with the emanations of evergreen forests are such as to indicate that the atmosphere is not only aseptic, but antiseptic, made antiseptic by some element which is not alone fatal to germ life, but at the same time is stimulant and tonic to normal physiological processes within the lungs. We are led to the conclusion that this antiseptic element of evergreen forests, an element which is not found elsewhere is the product of the atmospheric oxidization of turpentine. It is evident that the local and constitutional effects of turpentine are those of a powerful germicide, as well as a stimulant. Its presence in the atmosphere of the pine forests cannot be questioned. Again, ozone is said to be present in excess in the air of evergreen forests, and the beneficial effects of such an air have been ascribed to this substance alone. But it seems evident that there is a close relation between an excess of ozone in the atmosphere and turpentine exalation.

"'Recent developments in the treatment of phthisis by gaseous injections, if they are found beneficial, are apparently due to the arrest of septic poisoning, and not to the destruction of the tubercle bacilli. It is my belief that the atmosphere of evergreen forests acts in a similar manner, and facts seem to prove that the antiseptic agent which so successfully arrests putrefactive processes, and septic poisoning, is the peroxide of hydrogen, formed by the atmospheric exudation of turpentine vapours. It is stated that wherever the pine, with its constant exhalation of turpentine vapour and its never failing foliage can be distributed in a proper proportion to the population, the atmosphere can be kept not only aseptic but antiseptic by nature's own processes, independent of other influences, than a certain amount of sunshine and moisture. It is not possible for every one to take his weak lungs to an antiseptic air, but it is possible to render the air of most localities antiseptic. I would therefore, impress on the public the importance of preserving our evergreen forests, and of cultivating about our homes evergreen trees.'"

THE CUTTING OF TIMBER FOR PULP WOOD.

The conditions which obtain in the area covered by the Adirondack Park of the State of New York, in so far as the forest itself is concerned, are analogous to those in the wooded parts of Ontario, and the following extracts from the report of the New York Forest Commission for 1891, relating to the wood-pulp industry, the tendency to a natural regeneration of the forest under favorable circumstances, etc, are interesting in view of what is going on in our own Province: —

"The manufacture of paper from wood is a comparatively new industry in this country. Its rapid development and the consequent increase in the consumption of valuable forest products demands the attention of everyone interested in American forestry. The introduction of wood pulp was regarded with satisfaction by students of the forestry question, because they saw in its use a market for certain small-sized timber, the sale of which is necessary to an economic forestry management. The successful pecuniary results obtained in the management of European forests are due largely to the fact that there is a market for everything that is left after cutting the large-sized timber; and so the advent of the wood-pulp industry encouraged our forestry people to believe that operations in interlucation could now be carried on, as the sale of the thinnings would cover the expense.

"But the consumption of timber by the pulp mills has increased so rapidly as to endanger, instead of promote, the welfare of our forests. In the last eight years the amount of timber used for this purpose has increased 500 per cent. In the year just passed, 1891, the timber cut for wood pulp in the Great Forest of Northern New York, was equal to one-third the amount cut by the lumbermen.

"It is not the increased consumption of this forest product that is so noticeable, but the fact that the entire amount consumed is taken from young trees. Only a small amount of pulp timber can be gathered from the limbs and tops left by lumbering operations. Spruce and balsams furnish the main supply, and owing to their excurrent growth, only the tree trunks of these varieties are available.

"The pulp mills on the eastern side of the Great Forest use timber whose diameter runs from fourteen down to six inches. On the west side, the mills on the Black River use wood with a diameter as low as three inches. It will thus be seen that the introduction of wood-pulp, while it might be a valuable factor in economic forestry under proper management and restrictions, now indicates a speedy extinction of the conifers.

"The mills on the Upper Hudson use poplar to an extent of twenty-five per cent., and spruce for the balance; but the proportion of poplar used is growing less each year. The mills on the Black River use spruce, balsam, poplar and some small second-growth pine. Hemlock is used to some extent, when mixed with other kinds of wood. In making chemical fibre, however, the sulphite mills can use one-third hemlock. Tamarac is also used in small quantities, but it is a dark-coloured wood, and makes a dark, although strong paper. No cedar is used, nor any hardwood. On the Hudson the pulp timber is cut in the same length as logs, and is floated down the streams with the log drives. It is cut thirteen feet long, and is sent to the mill with the bark on. The most of the pulp timber for the Black River mills comes from St. Lawrence and Lewis counties, where it is cut into four foot lengths, measured, and sold by the cord, and shipped then over the Carthage and Adirondack Railroad. A large proportion

of the pulp timber cut in Lewis and St. Lawrence Counties is peeled before it is taken from the forest, thereby obviating the use of barking machines at the mills. This supply of peeled timber is cut during the bark season, which lasts from May twentieth to August fifteenth, before or after which time the bark will not peel.

"In estimates of a general character, one cord of timber is said to make one ton of brown pulp, dry weight; but the actual results indicate that a cord of wood will produce only 1,800 pounds. In the chemical process, two cords of wood are consumed in making a ton of dry pulp, or chemical fibre, as it is called.

"Wood pulp, or cellulose, when first manufactured in this country, was used for paper only, and to a comparatively small extent. But the industry has developed with surprising rapidity, and now almost the entire bulk of newspaper stock is made from wood. Other uses for it have been discovered, and these new adaptations are multiplying each year. Under the name of indurated fibre, it is used to a large extent in making tubs, pails, barrels, kitchen-ware, coffins, carriage bodies, furniture, and building material. In this State, there are pulp mills at Oswego and Lockport which manufacture various wares of indurated fibre, but these mills do not obtain their timber supply from the Adirondack forest. Wood pulp is also used to some extent in the manufacture of gun-powder.

"Prof. B E. Fernow, of the Forestry Bureau, at Washington, says in his last annual report:—'While the use of timber has been superseded in ship building, the latest torpedo ram of the Austrian navy received a protective armour of cellulose, and our own new vessels are to be similarly provided. While this armour is to render the effect of shots less disastrous by stopping up leaks, on the other hand, bullets for rifle use are made from paper pulp. Of food products, sugar (glucose), and alcohol can be derived from it, and materials resembling leather, cloth, and silk, have been successfully manufactured from it. An entire hotel has been lately built in Hamburg, Germany, of material of which pulp forms the basis, and it also forms the basis of a superior lime mortar, fire and water proof for covering and finishing walls.'

"The State of New York leads all other States in the manufacture of wood pulp, having seventy-five mills engaged in the industry, out of the 237 mills in the United States. Wisconsin comes next, with twenty-six mills; then comes Maine, with twenty-four; and then New Hampshire and Vermont, with eighteen each. Canada has also a very large production of wood pulp from its thirty-three mills, besides supplying large quantities of timber to mills situated in the United States.

"Of the seventy-five mills in the State of New York, sixty-four mills draw their entire supply from the Great Forest of Northern New York, or what is known as the Adirondack woods." (pp. 221-227).

SPONTANEOUS RENEWAL OF THE FOREST.

Where the efforts of nature are not thwarted by the ravages of fire, the tendency of the forest is to re-assert itself. The commissioners note that this is particularly the case where the previous cuttings have been conducted systematically, as for instance in the operations of charcoal-burners.

"After crossing the divide, the road runs for a few miles through State land some of which was burned over about twenty-five years ago, but which is now covered with a new growth of small trees, indicating that if this land is protected

from further damage by fire, it will in a short time completely reforest itself." (p. 113).

"From the Summit to Cedar River the appearance of the lands along the road is disappointing. There is too much open country, and too little of the forest scenery which one expects to see. The open country is due to unsuccessful efforts at farming, and the dwarfed condition of the trees to the disastrous fires which in some places have occurred repeatedly; but from Cedar River to Blue Mountain Lake the road runs for ten miles through an unbroken forest which, to an unpractised eye, shows no diminution of its primeval beauty. Though the lumberman cut off, years ago, the merchantable spruce and pine, they took so few trees to the acre that little trace remains of their operations, especially as the smaller evergreens that were left are fast taking the place of those which were cut." (p. 115).

"Part of the forest along this road was cut clean about twenty-five years ago by the charcoal burners, and persons interested in forestry matters will note with pleasure as they ride by, that the land has completely reforested itself, there being little in the present growth which would indicate to a casual observer that it differed from the original forest on the surrounding lands. There are large areas in this country which have been cleared by charcoal burners, but which are rapidly recovering their growth, their present condition affording an encouraging outlook for the future welfare of these forests." (p. 162).

"Beyond and west of this place are some abandoned charcoal kilns, which are responsible for the peculiar condition of the tree growth on either side for quite a distance. The forest was cut here by the charcoal burners, and every tree, large and small, was removed; but the land is now covered with a promising second growth.

"Throughout the entire region the lands which were cleared for charcoal reforest themselves quicker, and with a much more valuable growth, than those which have been denuded by fire. Fortunately, the cutting for charcoal resembles somewhat the coppice system, which is one of the recognized methods of forest management; and so, most of the stumps left by the charcoal axemen have sprouted persistently, and yielded a second growth exhibiting most of the original varieties, so far as the deciduous trees are concerned. But where the forest has been destroyed by successive burnings the soil and seeds are too badly scorched to reproduce the former trees, and so the land reforests itself with an inferior crop of small poplars and bird cherries. In driving through Essex County a good opportunity is offered for studying some of these phases of natural reforestation." (pp. 169-170).

"Before reaching Aiden Lair the road enters township 26, and for six miles passes through large tracts of State land, the most of this township having been acquired through defaulted taxes in 1877. Some of this land has been denuded by fire, but it was not burned so badly but that it is now reforesting itself. Of these burned tracts there is one, in particular, which offers an interesting study in reforestation, owing to a peculiarity in the process. The thick growth of small poplar and cherry which sprang up immediately after the fire is rapidly dying off and disappearing; but it in turn is being succeeded by a promising vigorous growth of spruce and balsam.

"In this vicinity there is another piece of second growth which is composed largely of white pine. The trees are strong and thrifty, and in a few years will be large enough for manufacturing purposes. This second growth white pine is inferior to the original. The trees are smaller, very knotty, and yield but little clear stuff. Still the knots are small, red and sound, and the lumber meets with

a ready sale. The time is near when the propagation of this variety of pine must enter largely into our forest management.

"The tract of second growth white pine, just referred to, lies along the road that runs from Minerva, through the Hoffman Township, within and near the south eastern boundary of the park. The land was once cleared and used for farming purposes; but it was abandoned and it is now overgrown with a thrifty crop of conifers. Had these lands been denuded by fire, instead of farming, the resulting crop of trees would have been of a different kind. Poplars and pin cherries would probably have appeared in that case. The fire burns into the ground, and destroys every hidden seed. Other seeds, distributed by well known agencies are subsequently deposited on its arid surface, of which the poplar and bird cherry are the only ones that will germinate in the then unfruitful soil." (pp. 197-8)

THE YELLOWSTONE NATIONAL PARK.

The superintendent of the far-famed Yellowstone National Park, in his report for the year 1890, makes the following remarks:—

"That the dedication in 1872 of the Yellowstone National Park as a heritage wonders for the enjoyment of the people was a wise and timely act few will now question.

"The Snake River Fork of the Columbia, and Green River Fork of the Colorado of the Gulf of California (Pacific waters), and nearly all the other great rivers of that portion of the continent, including the Jefferson, Madison, and Gallatin Forks, and the Yellowstone, Big Horn, and other branches of the Missouri-Mississippi Atlantic waters, to a great extent radiate from hot springs or spouting geysers within or adjacent to the great National Park, situated mainly in North-western Wyoming territory and also embracing portions of Idaho and Montana. There can be no doubt that the modern sulphur basins, salses, hissing fumeroles, and spouting geysers are only dwindled remnants of the ancient volcances and vast and long continued eruptions of lava, which, in the region of the National Park, characterized the elevation of the Great Plains and Rocky Mountain Ranges from the oozy bed of a shallow ancient sea.

"It is also evident that at some subsequent but remote period of time many of these mountain slopes were at an elevation of from 6,000 to 10,000 feet, covered with dense forests of timber, in size fairly rivalling those upon the Pacific coast, and that by some oscillation in the elevation of these regions, by eruptions of hot ashes, mud, and slime, like those which covered Pompeii and Herculaneum, or other all-powerful and long recurring agencies, forests have been crushed or covered, often many hundred feet deep, by conglomerate breccias or other volcanic material.

"Here erosion of the elements, or the blast, or pick and shovel of the tourist, unearth this ancient timber, which is often petrified entire into a perfect tree or log of stone; other timbers, while retaining their form, into opal or chalcedony, with amethyst or other crystalized cavities, matchless in shape, color and beauty, which, for cabinet specimens are unequalled elsewhere in nature and unrivalled by art.

"Many hot springs and mineral streams now petrify timber or coat it with sparkling lime or silica, build geyser cones and many beautiful forms of crystallization, but they are all clearly distinct, and mainly much inferior to those of the closing eruptive period. This wonderful region is really less one large park than a group of smaller ones, partially or wholly isolated, upon both sides of the continental divide, much lower in the park than the nearly unbroken surrounding mountain ranges. Its average altitude probably exceeds that of Yellowstone Lake, which is some 8,000 feet or nearly a half mile higher than Mount Washington. Its few yawning, ever difficult, often impassable, canon-approaches along foaming torrents. The superstitious awe inspired by the hissing springs, sulphur basins, and spouting geysers; and the infrequent visits of the surrounding Pagan Indians have combined to singularly delay the exploration of this truly mystic land.

"The animals of the region are the bison or mountain buffalo, elk, white-tailed deer, black-tailed deer, prong-horned antelope, big-horn sheep, bears, mountain lion or cougar, wolves, foxes, skunks, badger, rockdog, procupine, rabbits, rats, mice, burrowing moles, squirrels, chipmunks, beaver, otter, mink, muskrat, etc., birds, fishes, reptiles, and insects.

Timber of the Park.

"Black or bastard fir is far the largest variety of timber now growing in the park, and usually found scattered through forests of smaller timber near the Mammoth Hot Springs, Tower Falls, Upper Yellowstone, and other elevated terraces. It is often found from three to five feet in diameter, and one hundred and fifty feet in height, and is not unlike the eastern hemlock in the irregular form of it branched top as well as the coarse grained, shaky, and inferior quality of its timber.

"Black spruce, growing on the moist, sheltered slopes of the mountains near the snow, though having a smaller trunk, is fully as tall as the black fir, and is a statelier tree and more valuable for timber or lumber.

"Red fir is the next in size (which nearly equals that of the Norway pine of Michigan), and the first in value of any tree in the park for hewn timber for building bridges, etc., for which purpose it is admirably adapted. It is abundant in all except the very elevated regions

"White pine, rivalling in symmetrical beauty the white pine of the east, but much inferior in size, and somewhat in quality, is the prevailing timber of most of the elevated terrace groves, and occasionally of the narrow valleys and canon passes of the mountains. It grows very densely, often rendering travelling among it on horseback exceedingly difficult when standing and utterly impossible when burned and fallen, as it is over large areas of the park, proving one of the greatest impediments to exploring as well as to improvement by roads and bridle paths. It is the best material found in the park for lumber, shingles, small timber, rafters, fence poles, etc.

"Balsam fir, somewhat different from that of the Alleghanies, is abundant and very beautiful, singly or in dense groves or isolated clumps scattered over the grassy slopes, just below the mountain snow-fields.

"Cedar of a red or spotted variety, growing low, and very branched, but with timber valuable for fence posts, is abundant.

"Poplar or aspen is found in dense thickets among the sheltered foot-hills, dwarf-maple with leaves often scarlet with fungus, is sparingly found, and innumerable dense thickets of willow; the main value of all these last named varieties being for the food use of beaver or for bait."

Act of Dedication.

The Act by which the Yellowstone Park was dedicated or set apart is as follows:—

An act to set apart a certain tract of land lying near the head waters of the Yellowstone River as a public park.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the tract of land in the Territories of Montana and Wyoming lying near the head waters of the Yellowstone River, and described as follows, to wit:—Commencing at the junction of Gardiner's River with the Yellowstone River and running east to the meridian passing ten miles to the eastward of the most eastern point of Yellowstone Lake, thence south along the said meridian to the parallel of latitude passing ten miles south of the most southern point of Yellowstone Lake; thence west along said parallel to the meridian passing fifteen miles west of the most western point of Madison

Lake; thence north along said meridian to the latitude of the junction of the Yellowstone and Gardiner's Rivers; thence east to the place of beginning, is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people; and all persons who shall locate, settle, upon, or occupy the same or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom.

Sec. 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition.

The Secretary may, in his discretion grant leases for building purposes, for terms not exceeding ten years, of small parcels of ground, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction in the management of the same, and the construction of roads and bridle-paths therein. He shall provide against the wanton destruction of the fish and game found within said park and against their capture or destruction for the purpose of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this Act to be removed therefrom, and generally shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this Act.

Approved, March 1st, 1872.

Note.—The boundaries of the park had not then been surveyed, but they are mainly crests of snow-capped basaltic mountains encircling the wonderland of cataracts, canons, fire-hole basins, geysers, salses, fumeroles, etc., unique and matchless, with an entire area from fifty to seventy-five miles square.

Rules and Regulations.

The rules and regulations governing the conduct of visitors to the Yellowstone Park and the care of same generally, are the following:—

1st. All hunting, fishing, or trapping within the limits of the park, except for purposes of recreation, or to supply food for visitors or actual residents, is strictly prohibited; and no sales of fish or game taken within the park shall be made outside of its boundaries.

2nd. Persons residing within the park, or visiting it for any purpose whatever, are required under severe penalties to extinguish all fires, which it may be necessary to make, before leaving them. No fires must be made within the park except for necessary purposes.

3rd. No timber must be cut in the park without a written permit from the superintendent.

4th. Breaking the siliceous or calcareous borders or deposits surrounding or in the vicinity of the springs or geysers for any purpose, and all removal, carrying away, or sale of specimens found within the park, without the consent of the superintendent, is strictly prohibited.

5th. No person will be permitted to reside permanently within the limits of the park without permission from the Department of the Interior, and any person now living within the park shall vacate the premises occupied by him within thirty days after having been served with a written notice so to do by the superintendent or his deputy, said notice to be served upon him in person or left at his place of residence.

NOTE.—These rules and regulations are those adopted by the Hon. C. Delano, Secretary of the Interior, at the dedication of the park.

Additional rules subsequently issued are :—

(1) The cutting or spoilation of timber within the park is strictly forbidden by law. Also the removing of mineral deposits, natural curiosities or wonders, or the displacement of the same from their natural condition.

(2) Permission to use the necessary timber for purposes of fuel and such temporary buildings as may be required for shelter and like uses, and for the collection of such specimens of natural curiosities as can be removed without injury to the natural features or beauty of the grounds, must be obtained from the superintendent, and must be subject at all times to his supervision and control.

(3) Fires shall only be kindled when actually necessary, and shall be immediately extinguished when no longer required. Under no circumstances must they be left burning when the place where they have been kindled shall be vacated by the party requiring their use.

(4) Hunting, trapping, and fishing, except for purposes of procuring food for visitors or actual residents, are prohibited by law ; and no sales of game or fish taken inside the park shall be made for purposes of profit within its boundaries or elsewhere.

(5) No person will be permitted to reside permanently within the park without permission from the Department of the Interior ; and any person residing therein except under lease, as provided in section 2,475 of the Revised Statutes, shall vacate the premises within thirty days after being notified in writing so to do by the person in charge ; notice to be served upon him in person or left at his place of residence.

(6) *The sale of intoxicating liquors is strictly prohibited.*

(7) All persons trespassing within the domain of said park, or violating any the foregoing rules, will be summarily removed therefrom by the superintendent and his authorized employees, who are, by direction of the Secretary of the Interior, specially designated to carry into effect, all necessary regulations for the protection and preservation of the park, as required by the Statute ; which expressly provides that the same "shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be to make and publish such rules and regulations as he shall deem necessary or proper," and who, "generally, shall be authorized to take all such measures as shall be necessary or proper to fully carry out the the objects and purposes of this Act."

Resistance to the authority of the superintendent or repetition of any offence against the foregoing regulations, shall subject the outfits of such offenders and all prohibited articles to seizure, at the discretion of the superintendent or his assistant in charge.

Approved,

S. J. KIRKWOOD,
Secretary,

P. W. NORRIS,
Superintendent.

AN ACT TO SET APART A CERTAIN TRACT OF LAND IN THE STATE OF CALIFORNIA AS A PUBLIC PARK.

Whereas the rapid destruction of timber and ornamental trees in various parts of the United States, some of which trees are the wonders of the world on account of their size and the limited number growing, makes it a matter of importance that at least some of said forests should be preserved. Therefore, be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the tract of land in the State of California known and described as township number eighteen south, of range numbered thirty east; also township eighteen, south range thirty-one east, and sections thirty-one, thirty-two, thirty-three, and thirty-four, township seventeen, south range thirty east, all east of Mount Diablo meridian, is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasure ground, for the benefit and enjoyment of the people; and all persons who shall locate or settle upon, or occupy the same or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom.

Section 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition. The Secretary may, in his discretion, grant leases for building purposes for terms not exceeding ten years of small parcels of ground not exceeding five acres, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases and other revenues that may be derived from any source connected with the said park to be expended under his direction in the management of the same and the construction of roads and paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this Act, to be removed therefrom, and, generally shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this Act.

Passed the House of Representatives, August 23rd, 1890; approved September 25th, 1890.

ANCIENT FOREST LAWS.

The evolution of law in its relation to forests, game, etc., from the earliest days to the present time, presents an interesting field of study, but one which cannot be elucidated here. The following notes have been compiled from Manwood's work and other sources, and may serve to throw some light on the reasons which at various times have moved men to restrain the cutting of timber, as well as on the means which they have from time to time adopted with the view of providing a sufficient store of what in all ages has been regarded as a prime necessity, and which was never more so than now :—

By a law of King Ina it was enacted, that if anyone set fire to a wood, he should be punished, besides paying a fine of three pounds (an immense sum in those days) ; and for those who clandestinely cut, of which the very sound of the axe was to be sufficient conviction, for every tree they were to be mulcted thirty shillings. For a tree so felled, under the shadow of which thirty hogs could stand the offender was to be mulcted three pounds.

It was a law at Frankfort that every young farmer must produce a certificate of his having planted a certain number of trees (probably in proportion to his circumstances in life) before he was allowed to marry. In the Duke of Luxemburg's dominions, no farmer was permitted to fell a tree, unless he could make it appear, that he had planted another. Louis the XIV. of France would permit no oak trees to be cut, to whomsoever they might belong, till his surveying officer had marked them out; nor could they be felled beyond such a circuit as was sufficiently fenced in by him who bought them ; and then no cattle were allowed to be put in till the seedlings which sprung out of the ground, were perfectly out of danger.

In Saxon times, all beasts and birds that were wild by nature, were wholly the property of the king on whosever land or grounds they were found, whether any part of the realm, as well those that were out of the forests, chases, and warrens, as those that remained within any of them ; so that it was not lawful for any man to kill, take, or hunt within his own ground ; and if anyone did so, he was liable to be punished for the same. This law continued till Canute the Dane came to the English crown, who it appears appointed certain forests and chases and fixed their limits the first year of his reign. For the preservation of his own forests he made particular laws at Winchester, from which the following extracts are translated :—

(1) "Let there be then four men of the higher class who shall have the right, according to the custom which the English call *pegened*, followed in each Province of my kingdom, of distributing justice and of inflicting punishment, and of all matters concerning the forest, before all my people, whether English or Danes, throughout all the kingdoms of England ; which four we order to be called *primarii forestæ*, chiefs (or earls) of the forest.

(2) Let there be under each of these, four of the middling class of men (which the English call *lespegend*, but the Danes *yoong men*, and which would now be called yoemen, or perhaps esquires) who shall undertake the care and custody as well of vert as of venison.

(3) In administering justice, these (*yoong men*) shall not interfere in the least; and such middling persons, after having had the care of the wild animals, shall be held always as gentlemen, which the Danes call *caldermen*.

(4) Again, under each of these, let there be two of the lower class of men which the English call *tinemen;* (or in modern phrase, grooms): these shall take the night charge of vert and venison, and do the servile work.

(5) If anyone of this lower class shall be a slave, so soon as he is placed in our forest, let him be free, and we therefore discharge him from bondage.

(6, 7, 8) Relate to outfit.

(9) Relates to exemption from all summons and popular pleas (*hundred laghe*) hundred courts, and from all summons to any other court, except that of the forest.

(10) Let the causes of the middling and lower officers, and the correction of them, as well civil as criminal, be judged and decided by the provident reason and wisdom of the first class; but the enormities of the first class, if any should happen, (lest any crime should go unpunished), we will punish ourselves in our royal anger.

(28) Let no one cut any of our wood, or underwood, without leave of the chiefs of the forest; which if anyone do, he shall be adjudged guilty of an infringement of the royal chase.

(29) But if anyone shall cut down an oak (*ilicen*) or any tree that furnishes food for the beasts of the forest, beside infringement of the royal chase, he shall pay to the king twenty shillings.

(30) I will that every free man shall have venison or vert at pleasure in his open grounds, (plana) on his own lands, but without chase (or the right of punishing intruders); and let all avoid mine (venison or vert), wherever I think proper to have it.

(31 to 34) concern dogs and mad dogs. The term forest law is to be understood as applying to large tracts of enclosed land, where deer used to be kept. As the deer in those forests, and consequently the right of hunting them, were deemed to belong to the Crown, the forest themselves were brought under the same class of laws without reference to the deer; and they remained in this state, though the trees should fail the laws being executed by the crown with the right of forestage, and all the privilege of royal forests."

The laws of Canute were afterwards confirmed by divers succeeding kings, though in practice they generally appear to have been little if anything more than the will of the Crown, and were so administered until the barons and others encamped in hostile array on Runningmede from Monday the fifteenth to Friday the nineteenth of June, 1215; during which time they were actively employed in rough hewing the broad basis on which the bulwarks of our liberty are built, by forming the Magna Charta with King John.

The Magna Charta of 9th Henry III., Chap. 21, was the *Charta Foreste* of February 10, 1225.

Many liberties were then granted, and customs defined, but the restriction on cutting of wood appears to have been considerably felt.

The 13th of Edward the III., Chap. 1 and 2, gave considerable liberty for cutting and carrying wood, but it was to be done within view of the keepers of the forest.

In the 17th and 25th of Henry VIII., there are several acts respecting the forests, but they are principally modifications of former acts.

In the 35th of this reign was passed an Act for the preservation of wood, but principally respecting coal and billet wood. In Chap. 17, an Act for the preservation of timber, we find: "The king, our sovereign, perceiving and right well knowing the great decay of timber and wood universally within the realm of England, and that, unless a speedy remedy in that behalf be provided, there is a great and manifest likelihood of scarcity and lack, as well for building houses and

ships, as for firewood ; it is enacted, that in copse of underwood felled at twenty-four years' growth there shall be left twelve standrells or store oaks, on each acre, or in default of oaks, so many elm, ash, or beech, etc., and that they be of such as are likely trees for timber, and such as have been left at former fellings, if there have been any left before ; under pain of forfeiting 3s. 4d., for every such standard not left, one half to the crown, and the other to the party who may inform and may choose to sue for it in any court of record, which might be done as in an action for debt. When cut under fourteen years' growth, the ground shall be enclosed or protected for four years, by the proprietor or the lawful possessor of the wood under pain for not enclosing for every rood so left unenclosed 3s. 4d., for every month it may remain so unenclosed. No calves are to be put in for two years after felling, and no other cattle for four years. When cut from fourteen to twenty-four years of age to be six years enclosed under the same penalty ; after twenty-four years twelve trees to be left under penalty of 6s. 8d., each tree, the moiety to the Crown, and the informer may recover as before. The ground to be kept enclosed for seven years under the penalty of 3s. 4d. per rood per month as before." In the County of Cornwall, within two miles of the sea, trees might be felled when dead on the top.

No wood containing two or more acres, at the distance of two furlongs from the house of the owner was to be cut down under the pain of forfeiture of ten pounds for every acre of woodland so destroyed. Woods felled under fourteen years were afterwards not to have colts or calves put into them till eight years after cutting and enclosing. Most of these acts of Henry, etc., were only temporary till the 13th of Elizabeth, Chap. 25, when the time of protection was enlarged and the whole made permanent. By the 7th of Edward VI., Chap. 7, the Act of the 35th of Henry VIII., Chap. 3, was confirmed, and a little modified.

It was then enacted, that every faleshide (bundle of cleft wood) be four feet long beside the carfe; and if named one, to be marked one, and to be sixteen inches circumference within a foot of the middle ; if two, marked two, and twenty-three inches girt ; if three, marked as such, and to be twenty-eight inches girt ; if four, to girt thirty-three inches ; if five, to girt thirty-eight inches ; and so on in proportion. Billet wood was to be three feet four inches in length, the single one, to be seventeen inches and a half in girt, and every billet of one cast as they term the mark, to be ten inches about ; and of two cast, to be fourteen inches girt, and to be marked within six inches of the middle, unless for the private use of the owner. Every bound fagot should be three feet long, and the band twenty-four inches in circumference beside the knot. This Act was principally for London, but the 43rd of Elizabeth, Chap. 14, rendered the statute more general ; and ordered that the fagots should be every stick three feet in length except one to harden and wedge the binding of it. This was to prevent the abuse, then much practised, of filling the middle with short sticks. These Acts were confirmed by the 9th of Anne, Chap. 15, and the 10th of the same reign, Chap. 6, directs that the assize of billet shall not extend to beech, but that these shall not be sold in London or Westminster, unless the vendor make them of the same size as required by the Statutes for other wood. Chap. 17 of the 7th of Edward VI., is an Act for prevnting unlawful hunting in parks, places, forests, etc. ; and confirms the 38th of Henry VIII.

The 2nd and 3rd of Philip and Mary, Chap. 2, confirms that of Henry 7th and of the 20th of Henry VIII. ; and in the 27th of Elizabeth, there is another Act to the same effect, nearly as that of Henry VIII., which was then made permanent; and to render it still more complete and effectual in promoting improvement, it further enacts, that timber of twenty-two years' growth shall be exempted from tithes. By the 1st of Elizabeth, timber shall not be felled for iron-workers

of the breadth of one foot at the stub, and growing within fourteen miles of the sea or of the River Thames, Severn, Wye, Humber; Dee, Tyne, Tees, Trent, or any other navigable river or creek, under pain of forfeiture of forty shillings for every tree, one moiety to the Crown and the other to the informer, recoverable as before.

Second of Elizabeth, Chap., 19, is an Act for the preservation of timber in the wolds of Kent, Surrey and Sussex.

By the 43rd of Elizabeth, Chap., 7, it is enacted that if any idle person cut or spoil any wood or underwood, pales, or trees standing, and be convicted by the oath of one or more witnesses, if they cannot pay the satisfaction required, they shall be whipped. Receivers of wood so cut, knowing it to be so, to incur the same punishment.

The 2nd. of James I., Chap., 22, is an Act respecting bark, as it relates to tanners, curriers, shoemakers, and others concerned in leather. By Sec. 19, it is enacted, that no person shall contract for oak bark to sell again. By Sec. 20, that no person shall fell or cause to be felled any oak tree meet to be barked, where the bark is worth two shillings a cartload over and above the charges of barking and peeling, timber to be employed in building and repairing houses and mills excepted, but between the first day of April and the last day of June, upon pain of forfeiture of every such oak tree, or double the value thereof. And by Sec. 21, for the better preservation of timber, (which by the takers is spoiled through the desire of gain from the top and lop, or bark of timber trees,) it is therefore enacted, that no taker, purveyor, etc., or their deputies, shall fell for the use of the Crown any oak trees meet to be barked, but in the barking season except for the purposes before mentioned; or take or receive any profit, gain, or commodity, by any top, or lop, or bark, of any tree, to be taken or cut out of the barking season; and then only those for the king's house or ships, under pain of forfeiture to the party aggrieved (or on whose ground the tree may be cut) for every tree so felled forty shillings; and it shall be lawful for every party, of whom such tree shall be taken to retain all the bark, top and lop of the whole of such tree, notwithstanding any commission or other matter.

The 15th of Charles II., Chap. 2, is an Act to render the 43rd of Elizabeth more effective; and it enacts further punishment, on account that the destruction of wood tends to destroy the Commonwealth. It is therein declared that the officers of justice may apprehend even on suspicion of having carried, or in any way conveyed any burden or bundle of wood of any kind, underwood, poles, young trees, bark, or bast of any tree, gate, stile, post, rail or hedge-row wood, broom or firs, etc.

Chap. 3, of the 19th of Charles II., is an Act for the increase and preservation of timber in the forest of Dean. Eleven thousand acres are directed to be enclosed. Commissioners may sell decayed trees, to make good and maintain the said enclosures. When and how much shall be laid open, and by what authority as much shall be enclosed and has been opened, is declared. Wood fit for sale must be viewed and marked by the justices. Cutting wood contrary to this Act subjects the party offending to the penalties mentioned in former Acts. The enclosed land to be all re-afforested. All estates made out of it to any person whatever to be null and void. The king may retain game of deer, but not above eight hundred.

Proviso, for owners, tenants, and occupiers:—Former offences remitted; pannage shall be re-enjoyed after Michaelmas, 1687; and when and in what manner all privileges to be enjoyed. Letters patent for certain woods and iron works saved. Coal mines and grindstone quarries may be leased.

The 9th and 10th of William III., Chap. 36, is an Act for the preservation of wood in the New Forest, in the county of Southampton. Two hundred acres, part of this forest, to be enclosed for the growth of timber, after being set out by commissioners; two hundred acres more to be enclosed yearly for twenty years; and to remain in possession of the Crown for ever. Wood is not to be cut without sufficient authority. No coppice wood to be cut. Enclosures not to be ploughed or sown. The foresters to be fined, if they browse or lop any oak or beech tree in the forest. Charcoal not to be made within one thousand paces of the enclosure. Persons breaking down fences may be committed as rogues and vagabonds.

Ninth of Anne, Chap. 17, is for the preservation of white and other pine trees growing in Her Majesty's colonies of New Hampshire, Massachusetts Bay, and Province of Maine, Rhode Island, Providence plantation, and the new Narragansett country or king's province, and Connecticut in New England, New York, and New Jersey. No person within the said colonies shall presume to cut, sell or destroy, white or any other sort of pine tree fit for masts, not being the property of any private person, such trees being the growth of twenty-four inches and upwards at twelve inches from the ground, without the royal license for so doing, under the pain of forfeiting £100 for every such offence one moiety to the Crown and the other to the informer, who may recover the same in any court of record. The surveyor-general to mark the trees to be cut with the broad arrow; but no other person than he or his deputy to make any mark under the penalty of £5.

In the 12th of Anne, we find, an Act Chap. 9, for encouraging the importation of naval stores from America and Scotland for eleven years, and thence to the end of the next session.

Sec. 26 observes, "Whereas there are in several parts of North Britain, called Scotland, pine and fir trees fit for masts, and for making pitch, tar, resin, and other naval stores, but the land and wood which may yield such naval stores are mostly in parts mountainous and remote from navigable rivers, therefore for the encouragement of the proprietor of such lands and woods in making roads and passages in rivers in those northern parts useful and commodious to the public, as well as for conveying such naval stores to the seaports in North Britain, to be brought by sea to England; be it enacted, that there be given a premium for every ton of hemp, £6, of tar £4, of pitch £4, of resin £3, of masts 20s., to be paid by the officers of the navy on a certificate from the custom house officer where the stores are landed."

The first year of George I. presents us with an Act, Chap. 48, for the encouragement of planting and preserving woods. By it, maliciously setting fire to wood is made felony.

Sec. 17 of Chap. 2, 5th of George I., directs particular examination into the quality of Scotch tar.

The 6th of George I., Chap. 16, is another Act for the encouragement of planting and preserving wood. By it damage done to woods is made recoverable from the parish unless within a certain time it discovers and convicts the real offender.

Sec. 3 of Chap. 12 of the 8th of the same king directs, that the inspecting officer shall grant no certificate, unless the articles, of which tar is particularly mentioned, are of good quality. In it, many sorts of timber are enumerated as being imported from America; among them oak, wainscot, pine, etc.; and in consequence of these being imported from foreign countries, at very advanced prices, particularly in time of war, it is enacted that due encouragement be given

to importation from the colonies. The law respecting the pine, is nearly the same as enacted by Anne, but the penalty is reduced.

The 6th of George III., Chap. 36, is an Act for the better preservation of timber and trees. It is enacted, that every person, not being the lawful owner, who shall lop or top, cut or spoil, split down, damage, or otherwise destroy any kind of wood, underwood, poles, stack of wood, green stubs, or young trees, or carry or convey away the same, or shall have in their custody any such and shall not be able to give a satisfactory account how they came by them, shall be convicted before a magistrate on the oath of one or more credible witnesses, and be fined for the first offence, any sum not exceeding 40s., with all costs; for the second, not exceeding £5; and for the third offence be deemed an incorrigible rogue; oak, beech, chestnut, walnut, ash, elm, cedar, fir, asp, lime, sycamore, and birch, to be considered as timber.

This Act was confirmed by Chap. 33 of the 13th of George III., which further enacted, that poplars, alder, larch, maple, and hornbeam, should be deemed timber trees.

48th George III., Chap. 72, was for the better preservation of wood in the forest of Dean, similar to that of the 19th of Charles II., Chap. 3, where 11,000 acres are directed to be kept enclosed in the forest, and this Act enjoins 6,000 acres to be kept enclosed in the new forest, to be called nurseries for wood and timber. When the wood in such enclosures is past danger from the browsing of deer, etc., they may be laid open and other quantities enclosed. Every person who shall unlawfully destroy, or take away, or break any timber shall forfeit for the first offence £10, for the second £20, but the third offence is felony, and incurs a punishment of transportation beyond seas for seven years.

In 50 George III., we have an Act to extend and amend that of the 39th and 40th of the present reign for the preservation of timber in the New Forest, and to ascertain its boundaries; and another, Chap. 218, for disforesting the forest of Bere in the County of Southampton. The waste land, it observes, had been of great value and utility from the timber and underwood thereon, which of late years, has been much injured, and in many parts totally destroyed. In Sec. 64, it is enacted that no sheep, lambs. etc., be kept for ten years in any of the enclosures of the forest of Bere, unless the owners protect their neighbors' fences from such sheep, etc.

In 52nd George III., an Act was passed for making perpetual that of the 12th for lowering the duty on bark, after it came to a certain price.

The 10th of Charles I., Sec. 2, Chap. 23, referred to Ireland. By this it is enacted, that for cutting, peeling, barking, or otherwise destroying trees, the offenders shall be punished; and if they be poor and unable to pay the fine, they shall be whipped. If the constable refuse to execute the order of the justice of the peace to whip the offender, he shall be imprisoned till he agrees to do so.

10th William III., Chap. 12, enacted, among other things, that every person having an estate of freehold of £10 a year, and every tenant for years having a lease of eleven of those years unexpired, and paying £10 a year, shall plant or cause to be planted, at seasonable times, yearly, and every year during the term of thirty-one years, ten plants of four years' growth or more, of oak, fir, elm, ash, walnut, poplar, abele, or elder, in some ditch or elsewhere on the said lands, and preserve them from destruction. Every person or society having iron works shall plant or cause to be planted in ground sufficiently well enclosed for this purpose, five hundred trees of the aforesaid sorts on some of their ground yearly, and every year during such time or term as they shall keep or have the said iron works. Any person having 100 or more acres of land (plantation measure) or other tenants in common, shall, over and above the ten trees, within seven years,

enclose with a good sufficient fence of stone, wall, ditch, hedge, pale, or rail, one plantation acre thereof; and within seven years aforesaid plant at the least of the height of one foot above the ground when planted, and the age and at times before mentioned, for every ten feet square contained in such acre, in such method as they shall think fit, and keep the same enclosed and fenced from cattle for twenty years. No sheep or cattle shall be allowed to graze in these enclosures for twenty years under the penalty of 20s. for every such sheep, one moiety to the informer, and the other to the poor of the parish.

Then followed several other Acts, the most important of which is 23 and 24, Geo. III., Chap. 39, being an Act to amend the laws for the encouragement of planting timber trees.

It is worth while to notice the great encouragement which the legislatures of Scotland and England even in very ancient times held forth to the planting of trees. So far back as the year 1457, by a statute of James II, freeholders are enjoined to cause their tenants to plant woods, trees and hedges. This is followed by the Act of James IV., 1503, chap. 74; by the Act of James V., 1535, chap. 10; and by the Act of Charles II., 1661, chap. 41, which are all equally explicit.

Transcripts of these enactments are made and they are very curious in themselves, and were passed in time long before systematic forestry was thought of.

(1) Statute, James II, 14th parliament, 6th March, 1457: "Anent plantations of woodes and hedges, and sawing of broome; the lords thinks speedful, that the king charge all his freeholders, baith spiritual and temporal, that, in the making of their Whitsundayis set, they statute and ordine, that all their tennents plant woodes and trees, and make hedges, and saw broome, after the faculties of their mallinges, in places convenient therefor, under sik paine as law and unlaw of the barronne sall modifie."

(2) Statute, James IV, 6th parliament, 11th March, 1503, chap. 74, that hedges, parkes, and dowcottes and cunningares be made. "Item, it is statute and ordained, anent policie to be halden in the cuntrie, that everilk lord and laird, make them who have parkes with dears, stankes, cunningares, dowcottes, orchardes, hedges; and plant at the least, ane aicker of woode quhair there is na greate woodes nor forestes."

(3) Statutes, James V, 4th parliament, 7th June, 1535.

10. For planting of woodes, forrests, and orchardes. "Item, for policie to be had within the realme, in planting of woodes, making of hedges, orchardes, zairdes, and sawing of broome. It is statute and ordained, be the king's grace and his three Estaites of Parliament, that the actes maid thereupon of before by King James the First, and uthers our Soveraine Lorde's progenitoures, be observed, keiped, and put to sharpe execution in all poyntes, with this addition: That everie man, spiritual and temporal, within this realme, havand ane hundredth pounde land of new extent be zeir, and may expend sameikle, quhair there is na woodes nor forrestes, plant wood and forrest, and make hedges, and having for himself, extending to three aickers of land, and abone or under, as his heritage is mair or less in places maist convenient; and that they cause everie tennent of their landes, that has the same in tack or assedation, to plant upon their on-set, zeirly, for everie marke land, ane tree. Ilk laird of ane hundreth pound lande under the paine of ten pound, and lesse or mair, after the rate and quantity of their landes."

Forest fires in those days were of frequent occurrence, and involved, as now, very grave consequences. The Statutes of muirburn prescribed a period of the year when the burning of muirs was expressly prohibited under a penalty.

The first Scots Act for regulating muirburn is that of 1st James I, chap. 20, (Anno. 1424) In the following terms: "It is ordained, that na man mak muir-

burning after the moneth of Marche quhir all cornes be schorne, under the paine of fortie shillings, to be raised to the lord of the land of the burner, etc.

Subsequent Acts were 10 James III, Chap. 75, Anno. 1477; 4th James IV, Chap. 48; 6th James IV. Chap. 71; 6th James VI, Chap. 84.

There are also several British statutes regulating the time for making muir-burn. The 6th George III proceeds thus: "And whereas the laws now in force in that part of Great Britain called Scotland for preventing muir-burn in forbidden time are found defective and insufficient, whereby not only the game, but *also many valuable woods and plantations have been destroyed*; for remedy whereof, be it enacted, by the authority aforesaid, that no person or persons shall make muir-burn, or set fire to any heath or muir in that part of Great Britain called Scotland, from the last day of March to the first day of November in any year, under the penalty of 40s. lawful money of Great Britain, for the first offence," etc. This Act was amended by 13 George III, Chap. 54, sec. 3.

FOREST LANDS OF THE UNITED STATES.

A bill to provide for the establishment, protection and administration of public forest reservations, and for other purposes, was introduced in the Senate of the United States in June, 1892. It is unnecessary to set out the bill here, as it did not actually become law, but the report thereon which was submitted by Mr. Paddock, from the Committee on Agriculture and Forestry, contains matter of much value and importance as embodying an authoritative expression of opinion on the condition of the forest lands of the United States. It is given in full:—

The Committee on Agriculture and Forestry, having had under consideration the bill (S. 3,235) to provide for the establishment, protection, and administration of public forest reservations and for other purposes, submit the following report:—

(*1*) *The United States Government retains somewhat less than 70,000,000 acres of public domain which is designated as timber or woodland, mostly situated on the slopes and crests of the western mountain ranges.*

So little regard to the character and condition of the public lands has been given that it is impossible without much labor to determine how much woodland is comprised in them. An estimate was made in 1883, which places the woodlands at 73,000,000 acres, of which of course an unknown quantity has since been disposed of. There are still some woodlands undisposed of in Minnesota, Wisconsin, probably a small amount in Michigan, Louisiana, Mississippi, Alabama, and perhaps Florida, but the bulk lies on the Rocky Mountains, Pacific Coast, and Sierra Mountain ranges, mostly of coniferous growth (pines, spruces, firs, cedars, and redwoods) and mostly in subarid regions.

(*2*) *This property is at present left without adequate administration, nor is there in existence any practicable system of management by which the timber on it can be utilized without detriment to the future condition of the forest growth.*

The public lands are all held for the purpose of disposal to private holders, hence no further administration or management of the same beyond that incident to their disposal has ever been attempted. In the case of timber lands, however, it was recognized to a small extent that there was some additional value to them that needed consideration and special legislative measures. These measures have, however, been rather detrimental than otherwise to the future of this property, besides discriminating unjustly and imposing conditions which cannot practically be enforced.

In California, Washington and Oregon the law permitted the purchase of 160-acre tracts each by private citizens *for their own use*. The object of this law, which was evidently to encourage small holdings of timber lands in connection with agricultural lands and insure consequent protection and management of the same, has never been attained. It is alleged that millions of acres have been taken up under this act without intention to hold them for the use of the entryman, and immediately transferred to lumber companies, often foreigners, and immense tracts are being thus held for the same wasteful lumbering operations that have exhausted the forests of the east.

In the Rocky Mountain States timber lands could not be sold, but the citizens were authorized "to fell and remove timber on the public domain for mining and domestic purposes from mineral lands." In addition, railroad

companies are allowed to take timber for construction along their right of way. The impossibility of purchasing in a straightforward, honest way from the Government either timber or timber-bearing lands—

has compelled the citizens of these nine States and Territories to become trespassers and criminals on account of taking the timber necessary to enable them to exist.

Settlements upon timber lands in these States and Territories under the homestead and pre-emption laws are usually a mere pretense for getting the timber. Compliance with those laws in good faith where settlements are made on lands bearing timber of commercial value is well nigh impossible, as the lands in most cases possess no agricultural value, and hence a compliance with the law requiring cultivation is impracticable. As to cutting timber from mineral lands, perhaps not 1 acre in 5,000 in the States and Territories named is mineral, and perhaps not one in 5,000 of what may be mineral is known to be such.

By the provisions of the law approved March 3, 1891, the Secretary of the Interior is empowered to further regulate and restrict this cutting of timber for domestic and railroad use, but in the absence of officers to control and enforce these regulations and restrictions they are practically meaningless, especially since it is almost impossible to obtain convictions where all are equally violators by necessity, arising from absence of adequate and equitable legislation.

And even if it were possible to enforce the regulations, there could hardly be expected any method in the cutting performed by an unknown number of independent individuals, and such a system comes as near deserving the name of management as the pillaging of a city by a band of soldiers in war time deserves the name of municipal administration. To verify the general existence of these conditions the reports of the Secretaries of the Interior, the Commissioners of the Land Office for the last fifteen or twenty years, and the report of a special commission laid down in a volume called "The Public Domain," published in 1884 (House Ex. Doc. No. 47), may be consulted, or Bulletin II of the forestry division, Department of Agriculture, on the forest conditions of the Rocky Mountains.

(*3*) *In consequence of the absence of a well-developed system of administration, the value of this forest property is annually decimated by fire and by illegal and wasteful cutting.*

It is not necessary to argue this point, for it is a necessary corollary of the preceding.

The Senate Irrigation Committe, travelling two years ago in the western mountains, was for weeks precluded from any view by dense clouds of smoke from forest fires, and it is asserted that in that year more timber was burned than has been used legitimately since the settlement of that country.*

* The acres burned over and values destroyed during the census year 1880 were reported as follows :

States and Territories.	Acres burned over.	Value destroyed.	States and Territories.	Acres burned over.	Value destroyed.
California	356,895	$440,750	Utah	42,865	$1,042,800
Washington	37,910	713,200	Colorado	113,820	935,500
Oregon	132,320	593,850	Arizona	10,240	56,000
			New Mexico	64,034	142,075
Total Pacific slope	527,045	$1,747,800	Total Rocky Mountains	432,464	$6,780,371
Montana	88,020	$1,128,000			
Idaho	21,000	202,000	Grand total	959,509	$8,528,171
Wyoming	83,780	3,255,000			
Nevada	8,710	19,000			

The worst damage of these fires is not so much to be sought in the destruction of the standing timber but in the destruction of the forest floor, by which the chance for germinating of seeds and natural reforestation is annihilated, and the water regulating capacity of the forest is destroyed.

As to the amount of depredations, the following table, prepared from reports of the Land Office, is instructive, not only in showing the enormous amounts thus lost to the public treasury, compared with which the cost of a well-organized administration would be a mere bagatelle, but also by corroborating the statement that the loss is rarely recovered in the courts.

It should also be borne in mind that the cases reported do not by any means cover all cases of trespass, presumably only a small part, since the number of agents to ferret out the cases are ridiculously out of proportion to the area to be covered.

DEPREDATIONS ON THE PUBLIC TIMBER DURING ELEVEN YEARS.

Year.	Estimated value of timber reported stolen.		Amounts actually recovered, partly by compromise.	Appropriations for protection service.	Agents employed (number calculated on the basis of twelve months each per annum).
	Market.	Stumpage.			
	$	$	$	$	
1881	891,888	225,472	41,680	40,000	17
1882	2,044,278	511,069	77,365	40,000	31
1883	8,144,658	1,709,824	27,741	75,000	25
1884	7,289,854	1,093,178	52,108	75,000	26
1885	2,862,530	489,255	49,451	75,000	23
1886	9,339,679	1,726,516	101,086	75,000	21
1887	6,146,935	1,138,320	128,642	75,000	26
1888	8,397,500	840,145	128,522	75,000	25
1889	3,603,534	1,182,987	185,002	75,000	23
1890	3,067,152	832,420	100,942	75,000	29
1891	2,347,473	349,441	116,704	100,000	33
Total	54,135,481	10,098,627	1,009,243	780,000	*25

(4) It is a well-know fact, demonstrated by European experience and practice, that by a proper system of cutting not only can a forest be reproduced without the necessity of expensive replanting and kept continuously productive, but its yield per acre and year, in quantity and quality, can by proper management be increased considerably beyond that of the virgin forest left without management.

The methods of management for natural reforestation, or "regeneration methods," are practiced, especially in France and Germany, in broad-leaved as well as coniferous forests. The cutting of the old timber is done with a view of giving chance for seeds of the desirable species to sprout and for the young growth to develop satisfactorily. These methods prevail especially in the mountain regions, where planting would be expensive and sometimes impracticable.

Since in the well-managed forests only such species as are valuable are allowed to grow, to the exclusion of the inferior kinds, which the forester treats as weeds, the composition of the forest is improved, the growth is kept at the

*Average.

most favorable density for development, not only more individual trees but these of more servicable shape are growing, so that at the harvest the percentage of waste and useless material is reduced, and it is for these reasons that the yield, not only in quantity but also in quality, is increased.

While in our virgin forests the percentage of useful saw material is estimated to rarely exceed 20 or 25 per cent, the percentage in the French Government forests is over 50, which in pine and spruce of 130 years of age in Germany may reach the high figure of 60 to even 70 per cent; that is to say, the management of the crop is such that the firewood, branches, and waste material are kept down to from 30 to at most 50 per cent, of the total crop of wood.

Most of the timber cut and sawed in the United States is from trees more than 200 years of age, while the rotation, *i.e.*, the time during which the crop is allowed to grow in Germany, for most timber is not more than 100 years. Comparisons of absolute yield are therefore impossible to make.

But if we allow the high estimate of 10,000 feet board measure per acre to be an average for the United States, we learn from the large statistical material on hand for the German forest administrations that the yield of the German forests is at least three times as large and that produced in a shorter time. We leave out of consideration, of course, the yield of the Pacific Slope forests, which is beyond any average computation.

That it is judicious for the government to keep in view the question of timber supplies and to give, at least as far as it own holdings are concerned, timely attention to the future, if for nothing else than an example and object lesson, may be inferred from the following statement in regard to the outlook of available supplies and demand, which, while not claiming to present actual conditions, for which statistics are lacking, discusses possibilities or probabilities.

The chief of the forestry division, in an address before the real estate congress at Nashville, Tenn., in 1892, says :—

The area of timber land in the United States, although changing daily by clearing of new farms and by relapsing of old ones into woodlands, may roughly be placed at 500,000,000 acres. Even if we were to class as timber land all the land not occupied by farms or known to be without tree growth, this figure can not be increased more than 60 per cent.; that is, the utmost possibility of the area of natural woodlands in the United States must be within 800,000,000 acres. The former figure, however, comes probably much nearer the truth. How much of this area contains available merchantable timber it is impossible to tell, or even to guess at. We only know that supplies of certain kinds are wanting. For instance, the white pine of the North shows signs of exhaustion, the white ash has become scarce in many localities, the tulip poplar will not last long, and the black walnut has ceased to be abundant. All we can do is to estimate the range of possibilities.

With the utmost stretch of imagination as to the capacity of wood crops per acre, if we allow even the entire area of half a billion acres to be fully timbered, and keep in mind the enormous yield of the Pacific Coast forests, 1,250 or 1,500 billion cubic feet of wood is all that could be crowded upon that area. This figure would far exceed the most highly-colored advertisement of a dealer in timber land, except on the Pacific Coast ; in fact he would be afraid to assert one-half as much, for it would make the average cut of timber per acre through the whole country 10,000 feet board measure.

The above figure in cubic feet represents wood of every description, allowing as high as 33⅓ per cent. for saw timber.

Since we consume between 20,000,000,000 and 25,000,000,000 cubic feet of wood of every description annually, fifty to sixty years would exhaust our supplies, even if they were as large as here assumed and if there were no additional growth to replace that cut and no additional increase of consumption. Regarding the latter it may be of interest to state that according to as careful an estimate as I have been able to make upon the basis of census figures and other means of information the increase in the rate of consumption of all kinds of forest products during three census years, expressed in money values, was from round $500,000,000 worth in 1860 to $700,000,000 worth in 1870 and $900,000,000 in 1880, while for 1890 it may probably reach $1,200,000,000, an increase of about 30 per cent. for every decade, or somewhat more than the increase of population, which may in part be explained by higher prices.

It will also aid us in our conception of the situation to know that the saw mill capacity of the country in 1887 was round 200,000,000 feet (board measure) daily, which again may be figured equivalent to a probable consumption of wood of all kinds to the amount of at least 20,000,000 cubic feet round.

It remains to be seen what the chances are of supplying ourselves from the natural reproduction of our present forest area.

I have shown elsewhere that, while under the careful management of the German forest administrations, the average yearly new growth is computed at 50 cubic feet per acre, or 2.3 cubic feet for every 100 cubic feet standing timber, we can here, where there is no management at all, where fire and cattle destroy not only young growth but also the fertility of the soil, in spite of the originally greater reproductive power, expect no such annual crop.

From my observations I would not admit that more than one-half such annual growth is realized on the average over the whole area of 500,000,000 acres, and the likelihood is that much less is reproduced per acre.

Hence, while 500,000,000 acres reserved as forest at the very best would satisfy our annual consumption of 25,000,000,000 cubic feet—we need some 5,000,000,000 feet to supply our annual conflagrations—we are presumably cutting into our capital at the rate of at least 50 per cent. of our annual consumption ; that is to say, only one-half the annual cut is represented in annual new growth. What do these figures mean with reference to the subject in question ? Simply this, that while as yet prices for timber lands, and still less the price of lumber, are by no means advancing in proportion to the constantly growing reduction of standing timber supplies, when the general truth of these figures is recognized, which cannot fail to occur soon, timber lands will appreciate rapidly in value, and lumbermen, especially in the South, will regret their folly of having marketed their best supplies at unprofitable and unsatisfactory margins.

Nevertheless, it may be possible by a common-sense management and more rational methods of utilizing the timber, having some regard to the young growth, inaugurated now, to avoid the necessity of replanting at great cost and to maintain the present forest resources of the United States in sufficient and ever increasing productiveness.

(5) *It is also established beyond controversy that the forest cover, and especially the forest floor of leaves, twigs, decaying vegetable matter, underbrush, and root system, influence the regularity of the waterflow in springs, brooks, and rivers, as well as the state of the ground water level, the presence or absence of an efficient forest cover determining the percentage of subterranean or superficial drainage. Whatever the theories or facts regarding the influence of forest areas upon meteorological phenomena and climatic conditions—and these are partly at least still in controversy—there exists but little doubt, if any, among students and observers in regard to the influence which a forest cover exerts over the water drainage and soil conditions.*

Since it is in part upon the assumption of the existence of such an influence that the government is called upon to look to the preservation of forest conditions, and since the ideas regarding such influence are still more or less confused, it may be proper to explain more at length the action of the forest in this direction.

So far as formation of springs is concerned, no doubt, geological conditions and structure are of primary importance. This does not, however, exclude that the vegetable cover of the soil has at least a secondary influence upon the feeding and regular flow of springs. Even if we exclude any action of the forest upon the increase of precipitation, such as is claimed and partly sustained by observation there are various ways in which the supply of springs is influenced by forest cover.

The forest floor and the foliage breaking the force of the rain drops, prevent a compacting of the soil ; it remains porous and permits the water to percolate readily, changing a large amount of it from surface drainage into subterranean channels ; the root system, no doubt, works in the same direction. Forest floor and foliage also prevent rapid evaporation, and although the trees consume a large amount of water in their growth, evaporation is the worst dissipator of

moisture, and the balance, between the consumption and the saving of evaporation by forest growth, is largely in favor of this kind of vegetation as compared with any other vegetable cover or with naked ground, provided the forest floor of decayed leaves, twigs, etc., is not destroyed. Furthermore, the melting of snows is retarded under the forest cover, and finally the mechanical retardation of the surface water flow promotes subterranean drainage, insuring to springs a greater supply for a longer time.

This observation, very generally made, used to be explained by popular writers as due to the sponge-like condition and action of the forest floor, being able to take up water and then gradually giving it up to the soil below. Fortunately, the forest floor is rarely like a sponge, for a sponge never gives up water below, but always by evaporation above after the supply has ceased. The simile was an unfortunate one.

The open runs, *i. e.*, brooks, rivulets and rivers, receive their supply mainly from springs, but also from the surface waters which flow without definite channels down the slopes. The more the supply is derived from springs the more even is the water flow of the river; the greater the supply of the surface drainage the more dependent is the water flow on the changeful rains and on the melting of the snows, and the more changeful is the water flow. While, then, in the first place, the water flow in rivers is dependent upon the amount and frequency of rainfall and snow, the manner and time in which the water reaches the channels determines the greater or smaller extremes of water stages.

The retardation of the melting of the snow, which in a well-covered mountain district may be prolonged for two or three weeks under a forest cover, is of great significance in reducing the spring floods. The main influence, however, lies in the mechanical impediment which the forest floor opposes to the rapid surface drainage, promoting filtration to the soil and preventing the rapid filling of surface runs and lengthening the time during which the water is to run off. Observations in one of the reforested parts of the French Alps showed this retardation to be in the ratio of 5 to 3.

Thus, while in extreme cases, with excessive rainfalls or sudden rises of temperature in early spring, with steep declivities and impermeable rock formation, even a forest cover may have no practical effect in preventing a flood, it may be accepted as a generally true proposition that a forest cover has a tendency to lengthen the time to run off, and hence to reduce in amount and frequency flood conditions and to maintain the water flow more even with fewer excessively low and high stages.

Lastly, but of greater importance than has often been conceded to this influence, the forest cover prevents erosion of the soil and formation of the so-called detritus of rocks, gravels, and sands which, carried into the rivers, increase the danger from floods, impede navigation, and if deposited on fertile lands may, as in France, destroy the soil value of whole districts. Along the coast and in the sandy plains the protection of the loose soil and dunes against the disturbing action of the winds, and in the mountains which are liable to avalanches and snow-slides, as in Switzerland, the protective value of a forest is also well established. If there were any doubts regarding the influence of forest cover upon water and soil conditions before they have been entirely dispelled by the extensive reforestation work undertaken by the forest department of France.

There seventeen departments or counties had been impoverished and depopulated by the washing of the soil, torrential action of the rivers, and repeated floods, due to deforestation of the mountains, when the government adopted the policy of reclothing the denuded slopes with tree growth and sod. The popula-

tion in these counties had diminished from 10 to 20 per cent. within less than 20 years, and fertile fields had been covered up for more than 100 miles from the source of the soil, with the debris brought from the mountains by the rushing torrents.

The French Government has expended for reforestation of these mountains, during the last thirty years, over $35,000,000 and expects to have to spend more than the same amount in addition before the damage is repaired. The result of this work, some of which is now long enough established to show effect, perfectly justifies the anticipations of its efficiency. In the "perimeters" which have been recuperated the waters are carried off more slowly and without damage. These works in their result must quiet all theoretical discussion of the efficiency of forest cover in this particular. They present ocular proof not only of the fact that deforestation invites floods, erosion, and untold damage, but that reforestation is the method of remedying the damage and proper attention in time to the forest cover the method of obviating it.

Recognizing the value, then, which a forest may have in preserving proper water conditions and soil conditions, and perhaps, too, in some degree in climatic conditions, the conception in Europe of "protective forests" as distinguished from the "economic forest," that is, a forest which has value only from a material point of view, a policy has grown up in the higher developed nations of placing the first class of forests, which have a significance as a natural condition rather than as a source of material supply for the whole community, under government control, direct or indirect.

(6) Aside, therefore, from the undesirability of destroying or unnecessarily impairing a valuable resource of material, which can be continuously reproduced on land otherwise useless, there is strong reason why, especially in regions dependent upon irrigation for their agricultural development, favorable forest conditions should be carefully maintained.

Modern experience and scientific research have confirmed the experience of antiquity, namely, that plant production is primarily dependent upon water and that the management of water supplies is much more essential to the farmer even in the humid regions, than management of mineral constituents of the soil, for the latter can be supplied with ease, but the former can be regulated and supplied properly only with difficulty. If, then, water management becomes more and more important in all sections of our country, it is particularly so in those regions where, from natural causes, the supply is scanty. No artificial reservoirs can supply the more easily and cheaply maintained natural reservoir of the forest floor.

In this connection it will be well to quote the following language from a memorial recently transmitted to the President of the United States by the Colorado State Forestry Association, to which the Secretary of State, State engineer, State treasurer, attorney-general, and other leading officers of the State, together with the chambers of commerce of Denver and Colorado Springs, and some 500 leading citizens of the State have appended their signatures, recommending the reservation of all the timber lands in their State.

To his Excellency the President of the United States:

Your memorialist, the Colorado State Forestry Association, respectfully represents that the agriculture of this State, now rapidly increasing in magnitude and importance, is almost entirely dependent upon systems of irrigation. At least $13,000,000 are invested here in reservoirs, canals, ditches, and other works for the storage and distribution of water. No less than 13,000 miles of irrigating canals and main ditches are in operation or in course of construction in the State.

The agricultural yield of Colorado (exclusive of live stock) for the year 1891 amounted to $53,900,000 ; the mineral output for the same period was $33,549,000—a large sum, but greatly inferior to the one first named.

It will thus be seen how vitally important to the growth and continued prosperity of this Commonwealth is an abundant supply of water for irrigation. In fact it may be said that henceforth the agricultural yield of the State will be limited only by its water resources.

The streams upon which the irrigation systems of Colorado depend are fed by the springs, rivulets, and melting snows of the mountains, which in turn are nourished and protected by the native forests. Where the forests have been destroyed and the mountain slopes laid bare most unfavorable conditions prevail. The springs and the rivulets have disappeared, the winter snows melt prematurely, and the flow of streams, hitherto equable and continuous, has become fitful and uncertain. Floods and drought alternating clearly indicate that the natural physical conditions of the region have been unduly disturbed. In winter and early spring, when heavy masses of snow have been accumulated on treeless precipitous slopes, snow and landslides frequently occur with disastrous results to life and property. Even thus early in the present season a considerable number of valuable lives have been sacrificed in this manner.

The main Rocky Mountain range extends throughout the State, from north to south, and is flanked on either side by numerous spurs and minor ranges. The average or mean elevation of Colorado, 7,000 feet above the sea level, is greater than that of any other portion of North America. The high and rugged interior region contains 140 peaks or more, exceeding 11,000 feet elevation, and comprises about one-fourth of the area of the State. Small portions of this region are used for agriculture and grazing, but in the main it is unsuited for such purposes. Its surface, below timber line, was originally quite generally covered with a coniferous forest growth, but has subsequently been marred and disfigured by fire and the axe. Vast areas have been thus desolated. Above timber line proper there are many gulches and sheltered places, in some of which exist a stunted growth of trees and shrubs, where the drifting snows find lodgment, melting only during the summer months.

At certain of these greater elevations are found morasses, alpine lakes, and during portions of the year, ice fields of limited extent. The region is mainly one of cold and humidity for long periods of each recurring season. This is one of the principal, if not the chief, of the distributing centres of the continental water system. It contains the sources of the North Platte (in part,) the South Platte, Arkansas, Rio Grande, Dolores, Gunnison, Grand, White, Yampa, and other powerful streams, the preservation of which is not only important to Colorado but to neighboring States and Territories. New Mexico would be uninhabited were it not for the life-giving waters of the Rio Grande, which flow from the snow mountains of Colorado.

In view of the above, and in consideration of many recognized evils which follow the reckless and inconsiderate denudation of timbered areas, we respectfully ask that you will, under the act of March 3, 1891, cause to have withdrawn from disposal and constituted a forest reserve, all public lands along the crests of the mountain ranges and spurs in this State, as above mentioned, and upon either side thereof for a distance of 6 miles, more or less, according to the width of the timber belts in different localities and as may be deemed advisable after due official examination of the same.

We beg to represent further, that in our opinion the rights of prospecting and mining and right of way for public roads within the territory in question should remain inviolate, and that the general government should inaugurate at the earliest practical period a careful and conservative administration of such public lands. We also believe that, under proper regulation, a prudent and economical use of the forest resources may be had without endangering the perpetuity of the forests. Forest conservation should promote, rather than retard, all legitimate industries.

In this connection it is also worth while to quote the language of the chief of the forestry division from the annual report of the Secretary of Agriculture for 1891 :—

Water Management the Problem of the Future.

Before even attempting the control of precipitation, our studies, in the opinion of the writer, should be directed to secure better management of the water supplies as they are precipitated and become available by natural causes. How poorly we understand the use of these supplies is evidenced yearly by destructive freshets and floods, with the accompanying washing of soil, followed by droughts, low waters, and deterioration of agricultural lands.

It may be thought heterodox, but it is nevertheless true, that the manner in which most of the water of the atmosphere becomes available for human use (namely, in the form of rain) is by no means the most satisfactory, not only on account of the irregularity in time and quantity, but also on account of its detrimental mechanical action in falling, for in the fall it compacts the

ground, impeding percolation. A large amount of what would be carried off by underground drainage is thus changed into surface-drainage waters. At the same time, by this compacting of the soil, capillary action is increased and evaporation thereby accelerated. These surface waters also loosen rocks and soil, carrying these in their descent into the river courses and valleys, thus increasing dangers of high floods and destroying favorable cultural conditions.

Here it is that water management and, in connection with it or as part of it, forest management should be studied ; for *without forest management no rational water management is possible.*

(7) *Experience in the United States has shown that under private ownership, forest conditions are almost invariably destroyed or deteriorated, for the simple reason that the timber for present use is the only interest which private enterprize recognizes in the forest, not being concerned in the future or in the consequences of mismanagement to adjoiners, who have to suffer.*

It is therefore undesirable to transfer the ownership of the public timber lands to individual owners in the expectation of having them managed with a view to the broader interests of the community.

If there were need of other demonstration of this point beyond the history of the eastern forest lands, which have been for many years in the hands of private owners, we need only refer back to the working of the law in the Pacific Coast States, where such disposal to private holders has utterly failed in accomplishing its object. There is neither the interest nor even the knowledge to be found among the many to let us anticipate forest management by small holders. Besides foresty thrives best on large consolidated areas, from financial as well as technical considerations.

It will be necessary, in order to promote rational forest management, to do the same that all other nations have found necessary to do, namely, for the government to set the example and furnish the object lesson and opportunity for the others to follow.

The fact that a tree crop takes from fifty to one hundred years and more to grow to usefulness requires a patience and stability of ownership which our people have not yet attained, and hence the government must furnish the conservative elements where needed, as in our forest policy.

(8) *The cession of the public timber domain to the individual States with a view of having the States devise methods of conservative management, would fail in accomplishing the object for various reasons. Experience in the past with such cessions has not proved it practicable to place restrictions or conditions upon such cessions or to enforce them.*

Even if a cession, upon condition that the State provide efficient management, could be practically effected, lack of unity in the various systems and clashing of interests where watersheds are situated in more than one State, make retention of these lands in the general government desirable, or at least more promising of conservative results.

Other reasons of expediency make such a wholesale cession of timber lands impracticable. Among these may be mentioned the difficulty of segregating the timber lands from public lands of other description or transferring obligations of the general government toward railroad companies, resting upon such lands.

Nevertheless, co-operation with the State authorities in inaugurating a sound forest policy is most desirable, and should be made a prominent feature in whatever measures the general government may devise.

(9) *The present proposed legislation keeps in view the following principles :*

(a) *That the retention of the public timber lands in the general government, and their administration as such, is the only proper policy for all wooded areas of the public domain which do not stock on agricultural land.*

(b) That only a fully developed and separate system of management and administration, carried on by competent men under expert advice, can accomplish the objects of a rational forest policy.

(c) That the object of the public forest reservations is twofold, namely, to maintain desirable forest conditions with regard to waterflow, and, at the same time, to furnish material to the communities in their neighborhood.

(d) That while the service of protection of watersheds would warrant an expenditure out of other funds for such service it should, nevertheless, pay for itself by the sale of surplus forest material.

It is only necessary to add a few words of explanation on this latter point, says the chief of the forestry division in discussing the practicability of a government forest administration :—

To meet any objections on the score of expense, a rough estimate of this question may be made as follows :—

Allowing 50,000,000 acres of timber land reserved, I find that a tolerably efficient administration may be provided for a round $2,500,000, or 5 cents per acre. It would be satisfactory of course if only this expense be covered by the revenue. While the annual growth of wood per acre on the reserved area would exceed in value the assumed cost of administration the local market and consumption is restricted. But when we consider that the present saw-mill capacity of the region affected is over 3,000,000,000 feet B. M., and the resident population 3,000,000, requiring at least 50 cubic feet of wood material per capita, sufficient margin is assured even if only half of these amounts are furnished from the government reservations and the average charge for stumpage is taken at 10 cents.

And in another place (see Annual Report, 1886) :—

(7) The cost of the total service depends of course on the number of districts to be formed. Take Colorado alone, which we will assume contains about 5,000,000 acres of public domain. For this we may require three hundred rangers and ten inspectors, and the expense may be placed in round figures at $300,000. This amount could be saved by preventing only one-third of the forest fires, which seem to destroy over $900,000 worth of public property in that State yearly, and the 50,000,000 cubic feet or so of timber, which may be cut to satisfy the needs of the country for its development, would certainly, without hardship to any one, yield enough to help pay the expenses of less favorable localities and of the central bureau. The expense of the latter, with the necessary staff of clerks, etc., could certainly be kept within the sum of $50,000. Even if the whole forest area were as thoroughly organized as proposed for Colorado, the expense of the service would not be more than 30 per cent. of the income which might be derived from this domain, or, which could be saved, by preventing one-half of the fires that yearly destroy about an equal amount.

Referring to the operations of several European forest administrations we find that their expenditures represent from 37 to 58 per cent. of their gross income, or from $1.33 to $5 per acre, the net revenue being 96 cents to $4.40 per acre. These are results under conditions of very extensive management and under highest economic development. Taking Prussia alone, with a round 6,000,000 acres of forest and much poor and undeveloped country, the cut in 1890 amounted to round 333,000,000 cubic feet of wood, of which 215,000,000 feet went into cord-wood and 118,000,000 feet in saw-logs, or round 56 cubic feet of wood representing the annual growth per acre per year over the entire 6,000,000 acres, with a proportion of 45.6 per cent. in saw timber and wood for manufactures. The price received for this material in the woods, butt cut, was at the average rate of $10.63 per M feet, board measure, and $3.69 per cord, or both together about 5 cents per cubic foot of wood, the total income from wood being $16,225,000, of which 62 per cent. came from saw timber. Other revenues of the forest administration amounted to $17,632,810, or about $2.63 per acre, as against $10,888,893 in 1870.

The expenditures, amounting to $8,796,740, or, if special appropriations not recurring are deduced, to $8,582,268, represented 47.38 per cent. of the gross income. It may be of interest to indicate in what direction this large amount is expended :—

There are 122 officers in higher branches of administration, aggregating salaries to the amount of	$154,350
681 district officers or managers	588,276
3,753 underforesters or guards	1,162,867
114 financial agents	73,141
Other temporary employes and personal expenses	1,073,587
Total personalia	$3,052,221
Cost of harvesting wood crop (lumbering at a little less than 7 cents per cubic foot)	$2,266,030
Buildings	599,834
Roads and water ways	410,102
Surveys	110,226
Injurious insects	60,454
Culture	1,230,882
Sundries	280,073
Total salaries and administration	$8,009,822
Forestry schools and scientific research	* 48,130
Purchase of lands	304,156
Sundries	434,632
Grand total	$8,796,740

Or $1.33 per acre, leaving a net revenue of $1.30 per acre, as against 97 cents in 1870, when the expenditure per acre was 34 per cent. less.

(*10*) *The proposed legislation contemplates a segregation of the timber lands that are stocking on non-agricultural soil from the other public lands and the transfer of their administration from the Department of the Interior, where lands are held only for disposal, to the Department of Agriculture, which is designed to look after cultural matters and where a bureau in charge of forestry matters already exists.*

To save expense in the beginning and to create as quickly as possible an efficient protective service, the army may well be employed for such duty. This service has been conferred upon the army in the Yellowstone and the California parks to the full satisfaction of both officers and men, with the anticipated results as far as the protection of the forest property is concerned.

Co-operation with State authorities, such as forest commissions or commissioners, is provided for with a view of enlisting the authorities of the States in the upholding of a rational forest policy.

Since these forest reservations are not to be in the nature of parks, they are to remain open to public use and entrance for all purposes, excepting so far as restrictions appear necessary in order to protect the property from damage and depredation. Prospecting and mining are to be permitted under proper regulations.

The main features of the legislation, however, are its provisions for the cutting of timber under a system of licenses and the creation of the necessary force of officers to attend to the business of a regular forest administration pro-

* We (*i.e.*, United States) appropriate for a similar purpose, namely, the forestry division in the Department of Agriculture, whose function it is to build up an interest in the subject and to supply information on forestry matters where none existed before, less than one-half of this amount.

perly. The attempts hitherto of regulating the cutting of timber have remained futile for the lack of an organized system, and of the necessary force to maintain a system.

The license system here provided recognizes the various demands of settlers, prospectors, miners, and lumbermen as legitimate, and necessary to be provided for differently according to the nature of their business and in an equitable manner.

When all needs of the population can be legitimately satisfied, with a sufficient force of officers to attend to the wants of the public in a business-like manner, there is no reason why the existing vandalism with which the public timber domain has been wasted should not cease, destructive fires be reduced to a minimum, a system of proper forest conservancy gradually be developed, and the American nation add to its civilization by a rational treatment of the forests of the public domain at least.

In conclusion the fact is recalled that, as long ago as 1879 the writer of this report took occasion to refer to this subject before the Senate in the following language (see Congressional Record, February 10, 1879) :—

> There is another subject, Mr. President, not strictly agricultural, and yet so closely allied to that interest as to demand consideration always when agricultural questions are under discussion. I refer to the preservation of our forest lands from denudation. Those who have investigated and given much thought to the matter declare that the wholesale destruction of the forests of a country, without providing for a new growth, not only seriously affects the material interests but impairs the health and comfort of all the inhabitants thereof. Bitter experience long ago taught the people of the Old World that they could not with safety wage indiscriminate war against their trees. Nature is, indeed, a kind mother to those who exercise an intelligent regard for her habits and her laws, but she is at times terrible in her wrath against those who blindly defy her decrees. The laying waste of the forests of a country rudely disturbs that harmony between nature's forces which must be maintained if the earth is to be kept habitable for its teeming millions.
>
> We have ourselves heretofore sadly neglected these considerations, but our government cannot and must not much longer refuse to give to them its most serious attention. If we may not with propriety restrain the individual from injuring his own property, we can and should at least furnish information and devise plans through intelligent legislation, which shall incite him to coöperate with his neighbor to protect their common interests. Most European Governments have elaborated methods whereby they exercise a supervisory control over the forests of their dominions, and one day the public welfare will demand that our government shall follow their example. The subject is a practical one ; it is not a dream of the theorist ; it concerns the pockets of the people and their welfare in many ways.

Considering the very great importance of this measure early passage of the bill is recommended.

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